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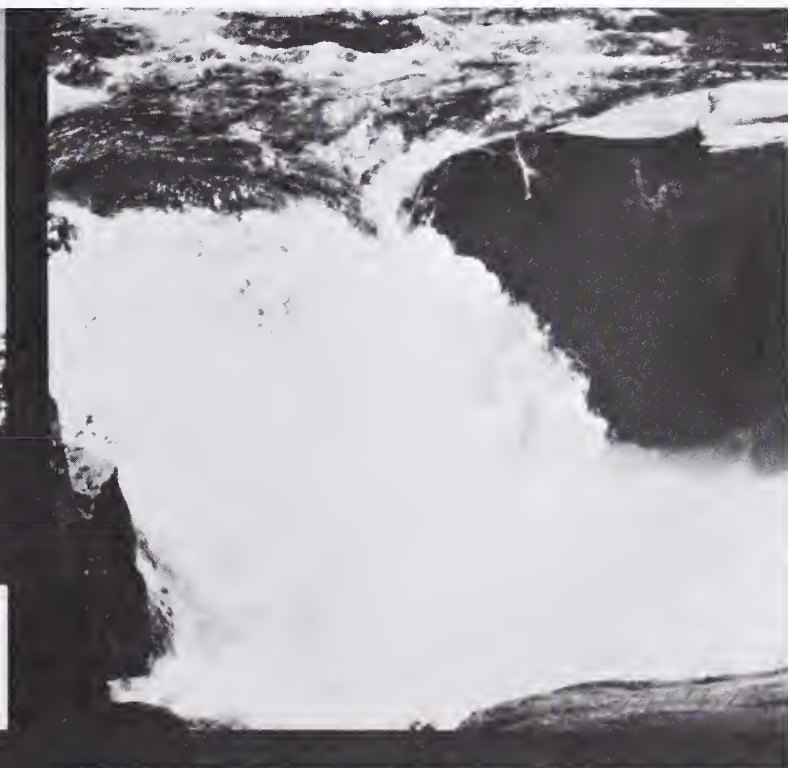
Montana Water Supply Outlook



May 1, 1988

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Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are terms reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado	2490 West 26th Ave., Denver, CO 80211
New Mexico	517 Gold Ave. S.W., Room 3301, Albuquerque, NM 87102-3157
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	1201 Terminal Way, Room 219, Reno, NV 89502
Oregon	1220 Southwest 3rd Ave., Room 1640, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201-1080
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82601

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 248, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Environment Technical Services Division, 9820 106th St., Edmonton, Alberta T5K 2J6.

Montana Water Supply Outlook and

Federal – State – Private Cooperative Snow Surveys

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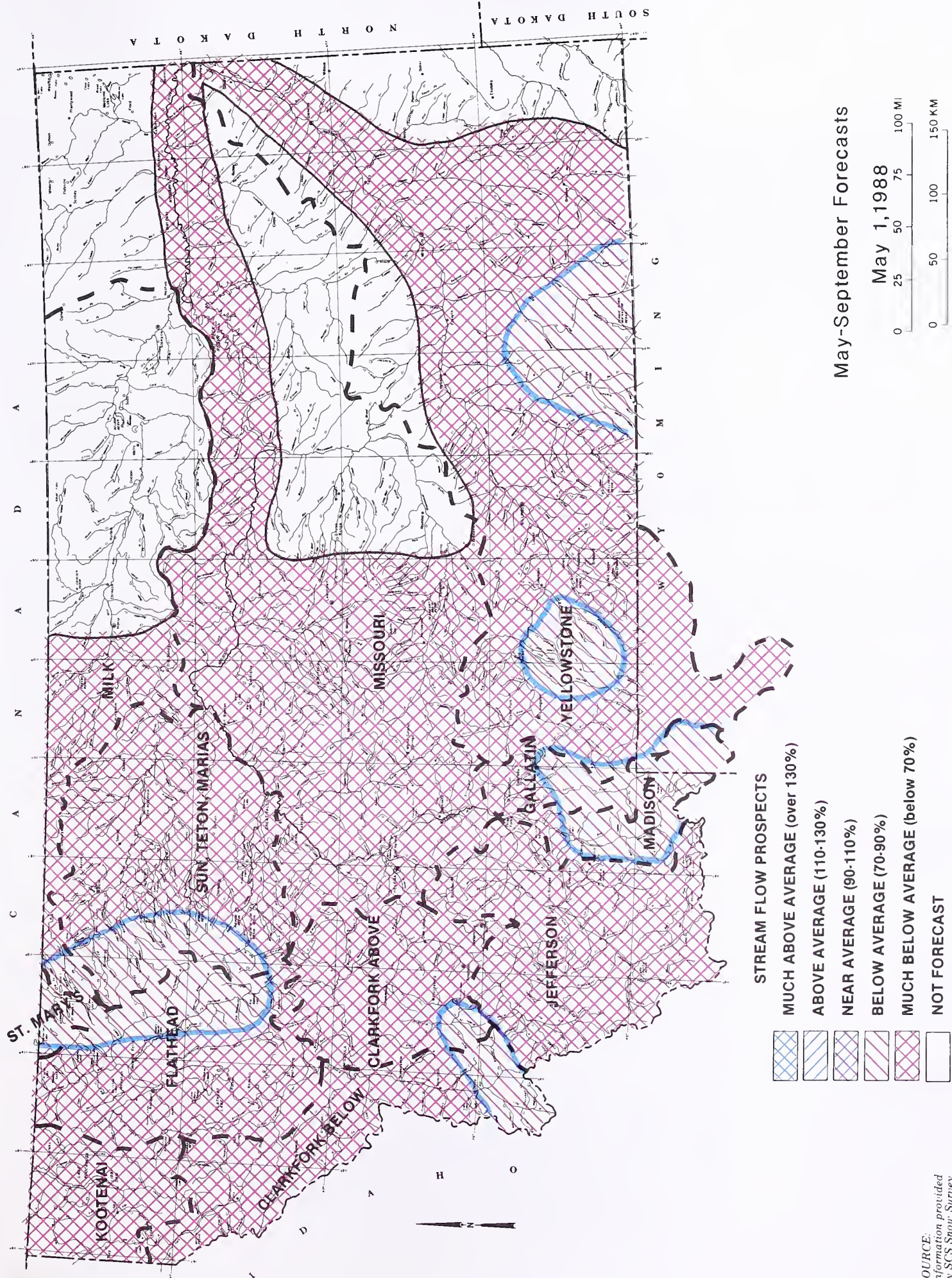
Programs and assistance of the United States Department of Agriculture are available without regard to race, creed, color, sex, age, or national origin.

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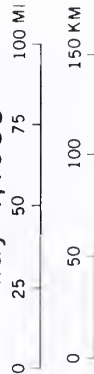
STREAMFLOW PROSPECTS FOR MONTANA

Spring and Summer Period



May-September Forecasts

May 1, 1988



SOURCE:
Information provided
by SCS Snow Survey
Personnel

General Outlook

Some areas in Montana will be facing shortages of water supplies for irrigation and other uses later this season. Contact your local Soil Conservation Service office for current snowpack and precipitation data and for assistance in operating with a reduced water supply.

Summary

Snowmelt during April was a little more than normal and snowpacks are now about 60 to 70 percent of average. April precipitation in the mountains was about average in the south and below average in the north. Runoff during the month was very near average over the western half of the State. Most west-side reservoirs have below average storage while others are generally at near or above average levels. Streamflow forecasts for May through September runoff are well below average in all areas. Water shortages are expected to be quite common after mid to late June.

Snowpack

Snowpacks increased until about mid-April then started to melt. Some showed slight increases near the end of the month. Almost all snow courses have lower May 1 water contents than were measured on April 1. All areas have below average snowpack with most areas showing water contents in the 60 to 70 percent of average range. Considerable melt at low and mid-elevations has reversed the trend of previous months where lower elevation snow was at a higher percentage than at higher elevations.

Precipitation

Mountain precipitation was generally below average in northern watersheds, about average across the central part of the State and above average in southern areas. Areas east of the mountains and in most mountain valleys reported below average April precipitation. May and June are normally the wettest months of the year. The amount and timing of precipitation during these months as well as July and August will be very critical in determining the impacts of this year's deficient snow accumulation.

Reservoirs

Most reservoirs showed some increase in storage as a result of April runoff. Most west-side reservoirs continue to show below average storage. Those in the Missouri River Drainage vary from below average to above average storage with the majority in the near to above average range. A few will probably not fill this year due to reduced inflows and downstream demands for water.

Streamflow

Runoff during April was near average over the majority of the State. This is a result of adequate precipitation and above average melt. Forecasts increased slightly in the southern half of the State and decreased slightly in the northern half. However, there will be less runoff to come in the following months as a result of the near average April runoff. Unless May and June are abnormally dry, this should be enough water for most users until mid to late June. At that time, water shortages are expected to be quite common until the end of the irrigation season.

Soil Moisture

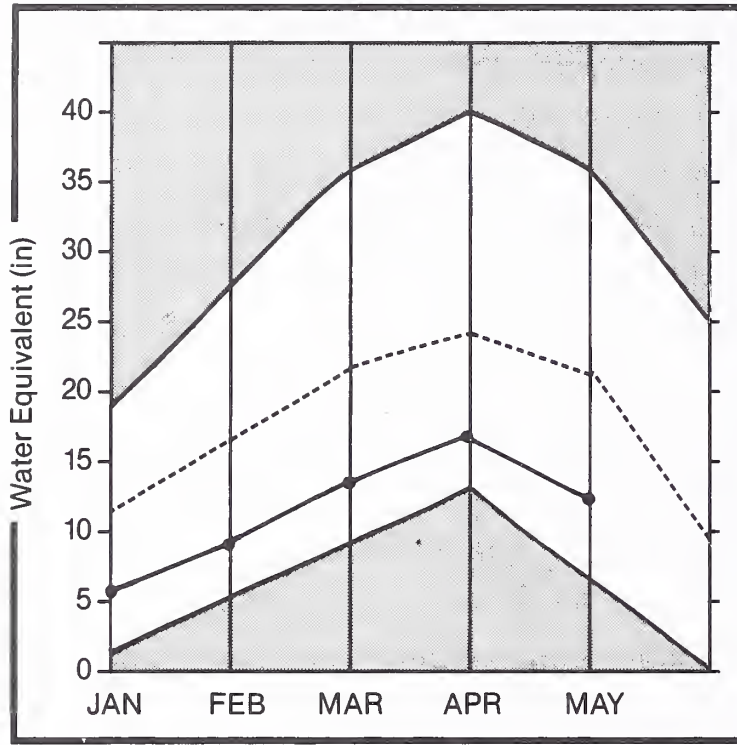
Mountain soil moisture levels have improved as a result of snowmelt and rainfall absorption. However, there still appears to be some moisture shortages in the deeper zones in most areas. Some valley areas are being irrigated earlier than normal to replenish soil moisture levels.

Peak Snowmelt Flows

Estimates of peak snowmelt flow ranges are shown on Page 32. All are for below normal peaks. The lower range is representative of peaks that would occur from snowmelt with little rain while higher ranges can be expected with moderate amounts of rain about the same time as snowmelt is peaking. It appears that peak snowmelt flows will be earlier than normal this year. Based on current snow and weather conditions, most streams are expected to reach their snowmelt peaks the third or fourth weeks in May. Streams with lower elevation headwaters will peak sooner. Higher elevation basins such as the Gallatin and Yellowstone Rivers and most of their tributaries are expected to peak in early June.

Kootenai Basin

Mountain snowpack* (inches)



*Kootenai in Montana

Maximum



Average



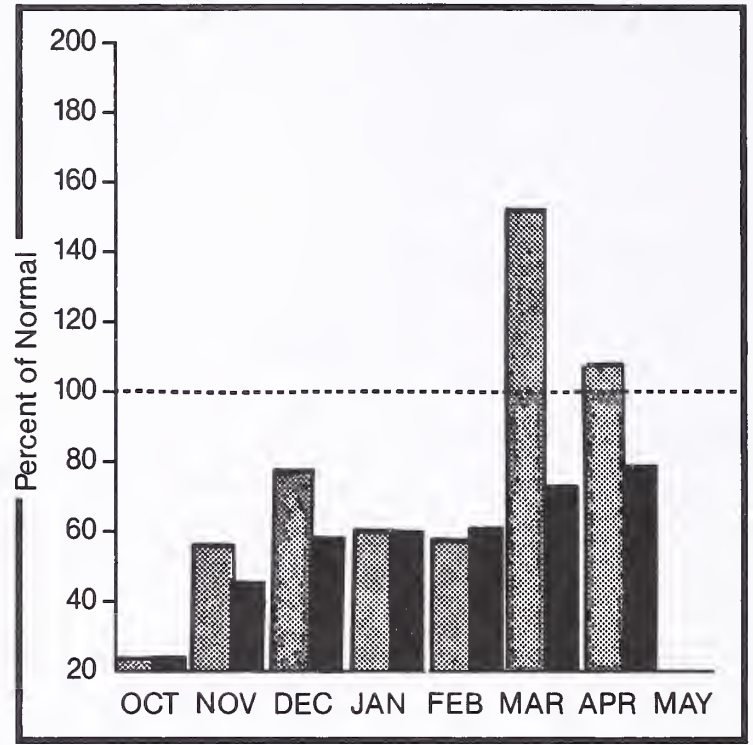
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



Water Supply Outlook

Mountain precipitation was near average in April. There was significant snowmelt this past month and the snowpack is now about 65 percent of average. Conditions in British Columbia are better than in the United States' part of the drainage. April runoff was above average. Streamflow is forecast to be below average in all drainages.

For more information contact your local Soil Conservation office

KOOTENAI RIVER BASIN in Montana

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
KOOTENAI RIVER blw Libby Dam 2	MAY-JUL	5438.0	3750.0	69	4670.0	86	2830.0	52
	MAY-SEP	6456.0	4500.0	70	5600.0	87	3400.0	53
FISHER RIVER near Libby	MAY-JUL	173.0	80.0	46	130.0	75	30.0	17
	MAY-SEP	189.0	91.0	48	146.0	77	36.0	19
YAAK RIVER near Troy	MAY-JUL	391.0	225.0	58	320.0	82	131.0	34
	MAY-SEP	414.0	235.0	57	335.0	81	136.0	33
KOOTENAI RIVER at Leona 2	MAY-JUL	6585.0	4560.0	69	5810.0	88	3310.0	50
	MAY-SEP	7685.0	5370.0	70	6830.0	89	3910.0	51

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE	
LAKE KOOCANUSA	5748.0	1648.0	2712.0	1932.0	EAST KOOTENAI in B.C.	26	100	73
					KOOTENAI in MONTANA	31	115	59
					KOOTENAI ab BONNERS FERRY	56	108	64

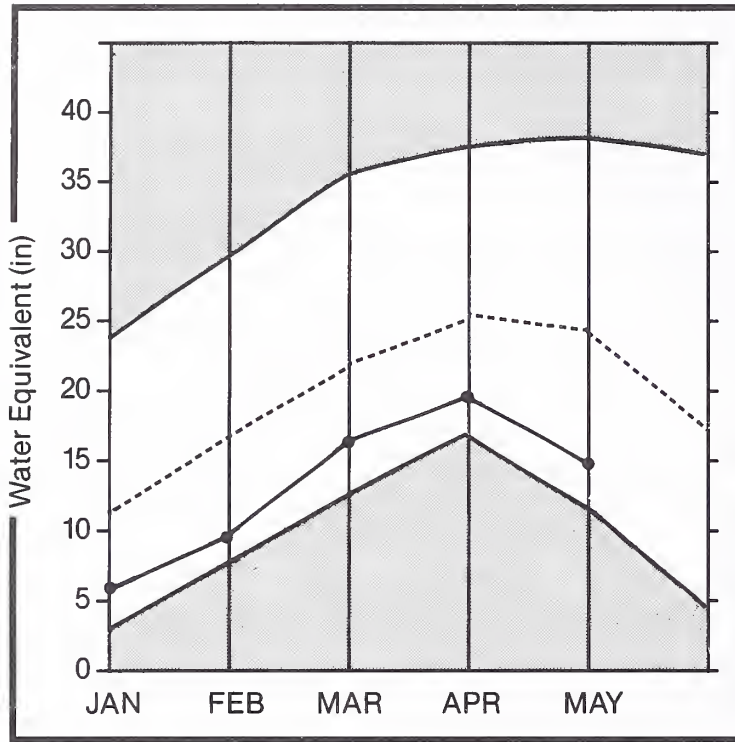
1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.

2 - Corrected for upstream diversions or changes in reservoir storage.

The average is computed for the 1961-85 base period.

Flathead Basin

Mountain snowpack* (inches)



*Flathead

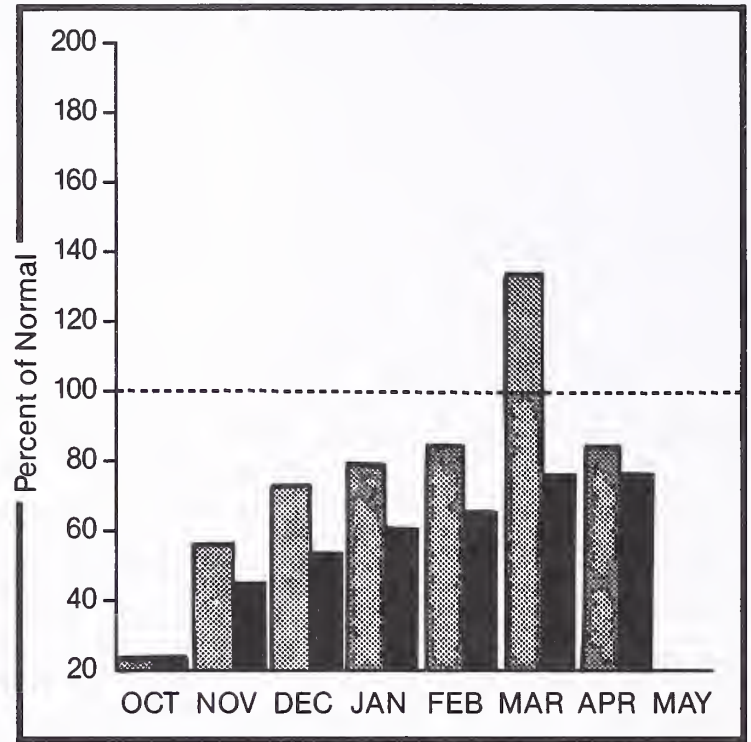
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

Water Supply Outlook

April precipitation was below average in the mountains of the Flathead River Drainage. Snowmelt has reduced the snowpacks to about 60 percent of average. West of the Flathead River, snow at the lower elevation watersheds is nearly gone. Generally, high elevation snow is 65 to 75 percent of average. Runoff in April was a little above average. Streamflows are forecast to be about 65 to 75 percent of average for the next five month period. The Middle and North Forks of the Flathead River are expected to reach their peak snowmelt runoff between mid and late May at a little below average.

For more information contact your local Soil Conservation office

FLATHEAD RIVER BASIN

STREAMFLOW FORECASTS

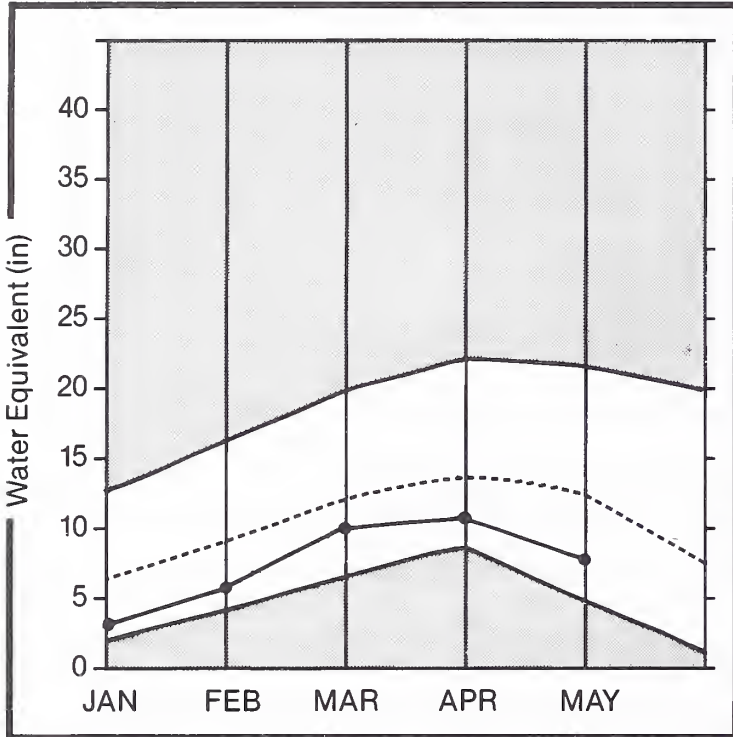
FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
NF FLATHEAD near Columbia Falls	MAY-JUL	1528.0	990.0	65	1440.0	94	550.0	36
	MAY-SEP	1708.0	1120.0	66	1620.0	95	630.0	37
MF FLATHEAD near West Glacier	MAY-JUL	1513.0	1030.0	68	1470.0	97	755.0	50
	MAY-SEP	1669.0	1160.0	70	1650.0	99	670.0	40
SF FLATHEAD near Columbia Falls 1	MAY-JUL	1861.0	1250.0	67	1640.0	88	835.0	45
	MAY-SEP	1998.0	1360.0	68	1780.0	89	920.0	46
FLATHEAD near Columbia Falls 1	MAY-JUL	5016.0	3380.0	67	4410.0	88	2410.0	48
	MAY-SEP	5518.0	3690.0	67	4800.0	87	2590.0	47
SWAN RIVER near Big Fork	MAY-JUL	509.0	325.0	64	420.0	83	235.0	46
	MAY-SEP	595.0	400.0	67	505.0	85	295.0	50
FLATHEAD RIVER near Polson 2	MAY-JUL	5834.0	3890.0	67	5130.0	88	2800.0	48
	MAY-SEP	6398.0	4160.0	65	5440.0	85	2880.0	45

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE	
CAMAS (4)	45.2	19.7	30.4	28.4	NORTH FORK FLATHEAD	14	94	60
MISSION VALLEY (8)	100.0	36.3	46.4	49.7	MIDDLE FORK FLATHEAD	11	123	63
HUNGRY HORSE	3451.0	1019.0	2665.0	2040.0	SOUTH FORK FLATHEAD	13	136	62
FLATHEAD LAKE	1791.0	864.0	944.8	929.0	STILLWATER-WHITEFISH	9	91	45
					SWAN	12	124	63
					LITTLE BITTERROOT	8	186	14
					FLATHEAD	47	114	59

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Clark Fork Basin above Missoula

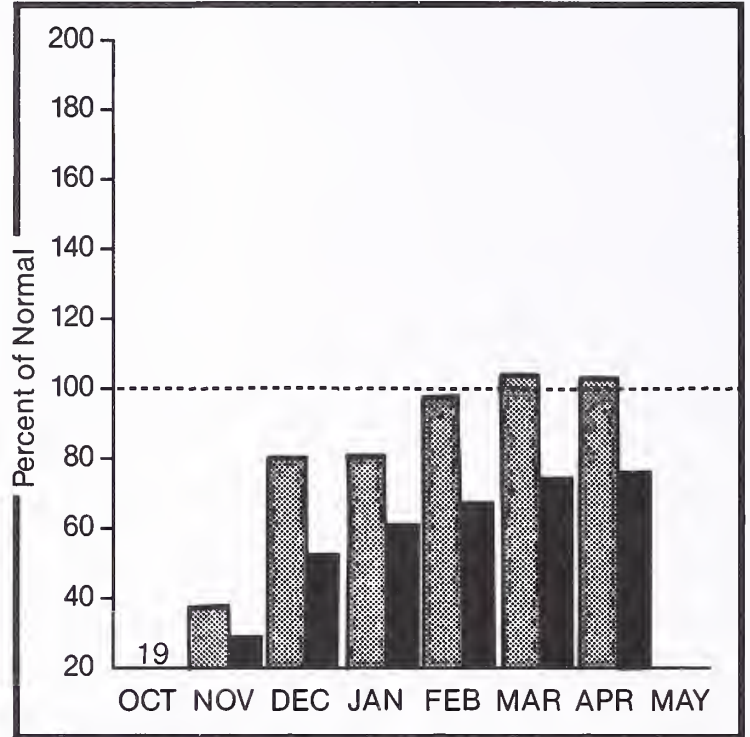
Mountain snowpack* (inches)



*Clark Fork above Missoula

Maximum ———
Minimum ———
Average - - - -
Current ●——●

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation ———
Year to date precipitation ———

Water Supply Outlook

April precipitation was about average across the mountains. Snowmelt has reduced the snowpack to about 60 percent of average in the headwaters area. Runoff was a little below average for April. Forecasts of streamflow for the next five months are generally in the 55 to 65 percent of average range. Irrigation water supplies are expected to be adequate in most areas until mid-June and then could become quite short for the rest of the irrigation season. Peak snowmelt runoff is expected to occur on most streams the third or fourth week of May and generate below average flows.

For more information contact your local Soil Conservation office

CLARK FORK RIVER BASIN above Missoula

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
MOULTON RESERVOIR Inflow (MG)2	MAY-JUN	197.0	120.0	61	169.0	86	71.0	36
	MAY-JUL	222.0	136.0	61	192.0	86	81.0	36
HARM SPRINGS at Meyers Dam 2	MAY-JUL	35.0	23.0	66	32.0	91	14.0	40
	MAY-SEP	44.0	30.0	68	41.0	93	19.0	43
FLINT CREEK near Southern Cross 2	MAY-JUL	13.4	8.0	60	13.0	97	3.0	22
	MAY-SEP	16.4	9.4	57	15.0	91	4.0	24
FLINT CREEK below Boulder Creek 2	MAY-JUL	54.0	33.0	61	52.0	96	14.0	26
	MAY-SEP	70.0	44.0	63	69.0	99	20.0	29
LOWER WILLOW CR RES Inflow 2	MAY-JUL	12.5	7.2	58	12.0	96	3.0	24
	MAY-SEP	13.4	7.9	59	13.0	97	3.0	22
M. FK. ROCK CRK near Philipsburg	MAY-JUL	65.0	46.0	71	61.0	94	31.0	48
	MAY-SEP	73.0	52.0	71	69.0	95	35.0	48
NEVADA CREEK near Finn	MAY-JUL	17.0	9.4	55	15.0	88	3.0	18
	MAY-SEP	18.0	10.3	57	17.0	94	4.0	22
BLACKFOOT RIVER near Bonner	MAY-JUL	760.0	465.0	61	610.0	80	320.0	42
	MAY-SEP	854.0	535.0	63	690.0	81	380.0	44
CLARK FORK RIVER above Milltown 2	MAY-JUL	597.0	370.0	62	580.0	97	160.0	27
	MAY-SEP	706.0	445.0	63	690.0	98	200.0	28
CLARK FORK RIVER above Missoula	MAY-JUL	1357.0	835.0	62	1330.0	98	340.0	25
	MAY-SEP	1560.0	975.0	63	1540.0	99	405.0	26

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE	
GEORGETOWN LAKE	31.0	27.7	29.8	24.3	CLARK FORK ab BLACKFOOT	42	253	63
LOWER WILLOW CREEK		NO REPORT			BLACKFOOT	22	196	57
NEVADA CREEK	12.6	4.6	7.9	10.2	CLARK FORK above MISSOULA	58	231	62

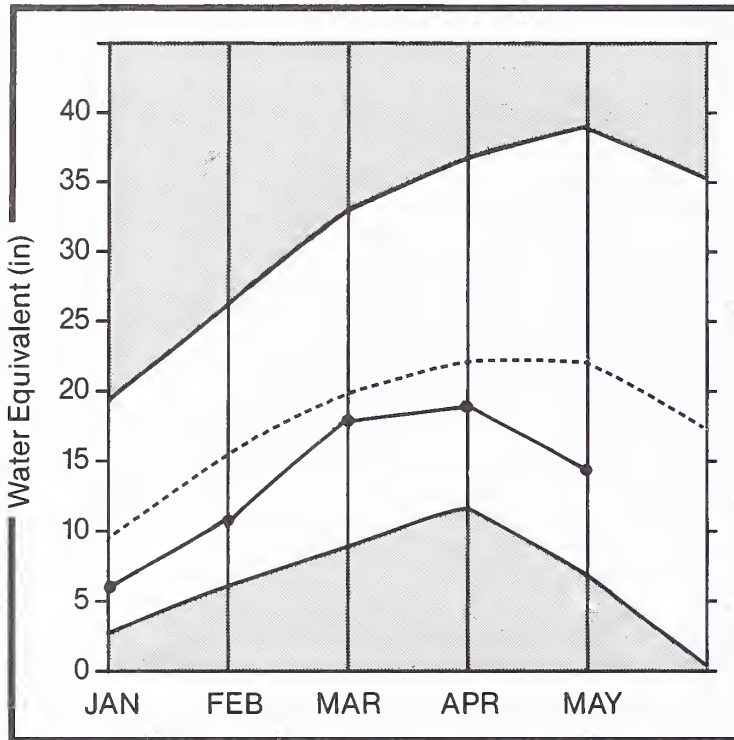
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2 - Corrected for upstream diversions or changes in reservoir storage.



The average is computed for the 1961-85 base period.



Clark Fork Basin below Missoula

Mountain snowpack* (inches)

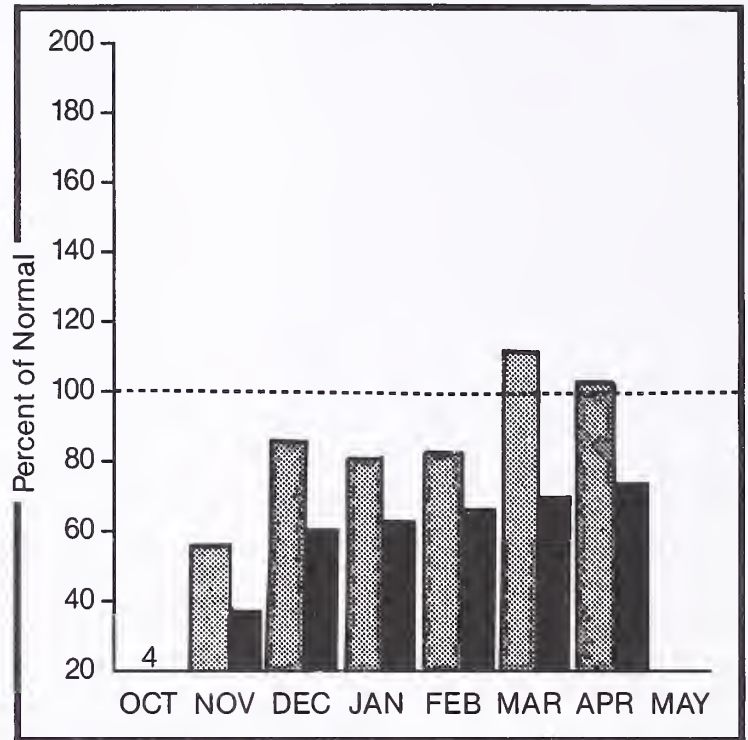


*Bitterroot


Maximum 
Minimum 


Average 
Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation 

Year to date precipitation 

Water Supply Outlook

During April, the mountain precipitation was about average across the basin. Snowpacks melted last month and now have water contents about 65 percent of average in the Bitterroot and 58 percent of average in drainages below Missoula. Streamflows were about average this past month. Runoff for the May through September period is predicted to be around 65 to 75 percent of average. Early season irrigation water should be adequate for most users but shortages are expected to start developing by late June. The Bitterroot River is expected to have its peak snow-melt runoff near the end of May and generate flows a little below average.

For more information contact your local Soil Conservation office

CLARK FORK RIVER BASIN below Missoula

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
CLARK FORK RIVER above Missoula	MAY-JUL	1357.0	835.0	62	1330.0	98	340.0	25
	MAY-SEP	1560.0	975.0	63	1540.0	99	405.0	26
W. F. BITTERROOT RIVER nr Conner 2	MAY-JUL	135.0	104.0	77	138.0	102	70.0	52
	MAY-SEP	156.0	120.0	77	159.0	102	81.0	52
BITTERROOT RIVER near Darby	MAY-JUL	470.0	325.0	69	445.0	95	210.0	45
	MAY-SEP	519.0	355.0	68	475.0	92	235.0	45
SKALKAGO CREEK near Hamilton	MAY-JUL	48.0	34.0	71	41.0	85	27.0	56
	MAY-SEP	57.0	41.0	72	48.0	84	34.0	60
BURNT FORK CR nr Stevensville 2	MAY-JUL	30.0	20.0	67	29.0	97	11.0	37
	MAY-SEP	35.0	23.0	66	32.0	91	14.0	40
BITTERROOT RIVER at Missoula 2	MAY-JUL	1239.0	865.0	70	1060.0	86	670.0	54
	MAY-SEP	1354.0	935.0	69	1150.0	85	720.0	53
CLARK FORK RIVER below Missoula	MAY-JUL	2586.0	1700.0	66	2160.0	84	1240.0	48
	MAY-SEP	2914.0	1910.0	66	2440.0	84	1380.0	47
CLARK FORK RIVER at St. Regis	MAY-JUL	3379.0	2190.0	65	2870.0	85	1510.0	45
	MAY-SEP	3809.0	2490.0	65	3250.0	85	1730.0	45
CLARK FORK RIVER near Plains 2	MAY-JUL	9541.0	6060.0	64	7590.0	80	4530.0	47
	MAY-SEP	10621.0	6790.0	64	8490.0	80	5090.0	48
THOMPSON RIVER near Thompson Falls	MAY-JUL	180.0	80.0	44	123.0	68	37.0	21
	MAY-SEP	209.0	96.0	46	140.0	67	52.0	25
PROSPECT CREEK at Thompson Falls	MAY-JUL	101.0	60.0	59	79.0	78	41.0	41
	MAY-SEP	110.0	66.0	60	86.0	78	46.0	42
CLARK FORK at Whitehorse Rapids 2	MAY-JUL	10538.0	6620.0	63	8100.0	77	5140.0	49
	MAY-SEP	11764.0	7450.0	63	8980.0	76	5920.0	50

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE THIS YEAR	LAST YEAR	** AVG.	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE
PAINTED ROCKS LAKE	31.7	17.7	---	21.0	CLARK FORK above MISSOULA	58	231 62
NOXON RAPIDS	335.0	275.6	329.1	186.3	BITTERROOT	24	220 65
COMO	34.9	18.2	22.3	19.4	LWR CLARK FK blw MISSOULA	24	129 58
					BITTERROOT & LWR C.F.	46	156 62
					CLARK FORK TOTAL	98	177 61
					FLATHEAD	46	115 59
					PEND O'REILLE	138	148 60

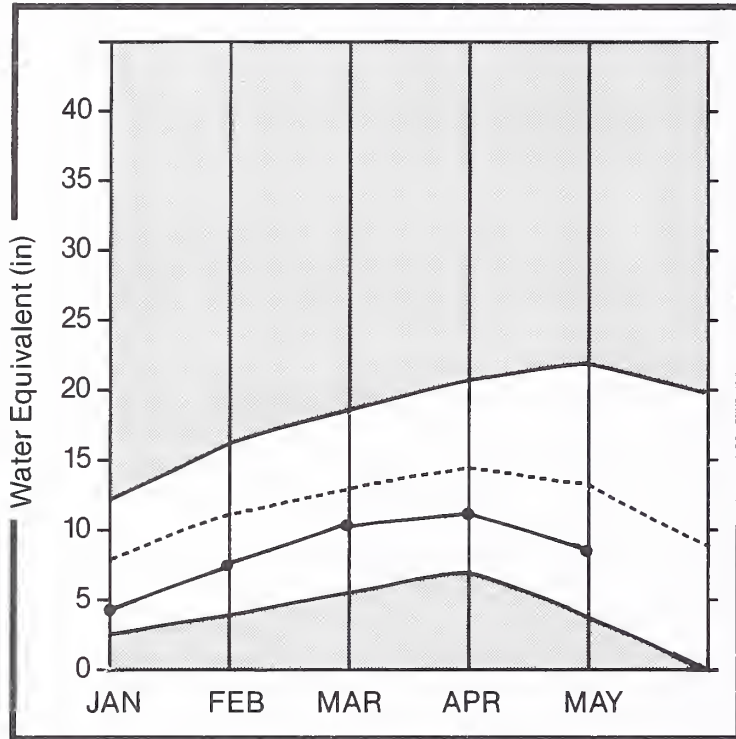
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Jefferson Basin

Mountain snowpack* (inches)



* Jefferson

Maximum



Average



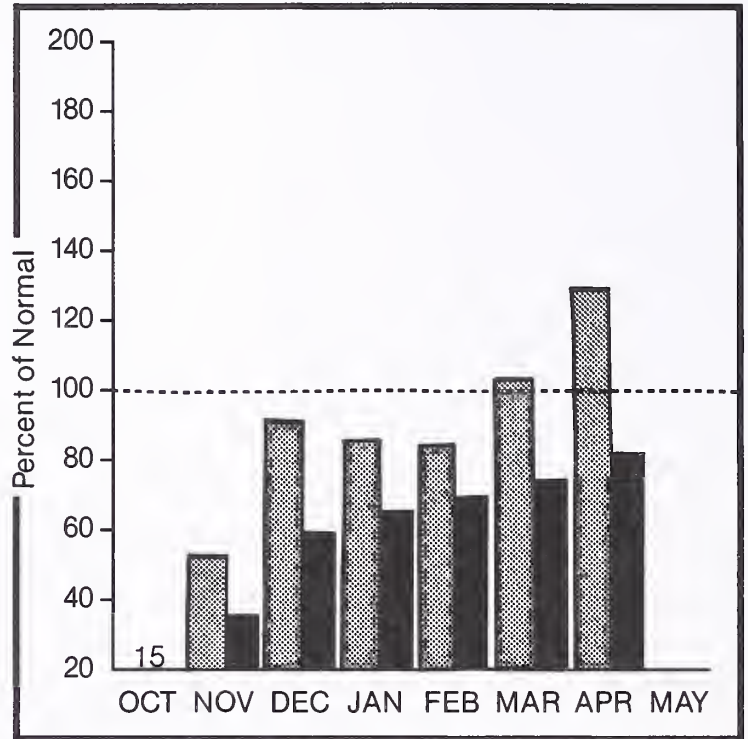
Minimum



Current

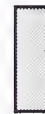


Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



Water Supply Outlook

During April, precipitation across the mountains was above average. Snowpacks continue to contain well below average amounts of water due to below normal early season accumulation and melt in the last half of April. Runoff in April was about average as a result of precipitation and melt. Total runoff over the next five months is forecast to be quite low with the poorest conditions in the Beaverhead River Drainage. Shortages of irrigation water supply are expected to develop by mid to late June. The snowmelt peak is expected to be near the end of May on the Big Hole and Ruby Rivers and produce a little below average flow.

For more information contact your local Soil Conservation office

JEFFERSON RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
RED ROCK RIVER near Monida 2	MAY-JUL	80.0	45.0	56	78.0	98	12.0	15
	MAY-SEP	89.0	50.0	56	87.0	98	13.0	15
BEAVERHEAD RIVER near Grant 2	MAY-JUL	109.0	49.0	45	93.0	85	5.0	5
	MAY-SEP	133.0	57.0	43	110.0	83	4.0	3
BEAVERHEAD RIVER at Barratts 2	MAY-JUL	143.0	69.0	48	126.0	88	12.0	8
	MAY-SEP	175.0	88.0	50	158.0	90	18.0	10
RUBY RIVER near Alder	MAY-JUL	75.0	49.0	65	66.0	88	33.0	44
	MAY-SEP	92.0	61.0	66	83.0	90	39.0	42
BIG HOLE RIVER near Melrose	MAY-JUL	612.0	385.0	63	570.0	93	200.0	33
	MAY-SEP	673.0	430.0	64	630.0	94	230.0	34
WILLOW CREEK near Harrison	MAY-JUL	16.2	10.5	65	17.0	105	4.0	25
	MAY-SEP	18.6	12.3	66	20.0	108	5.0	27

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE
LIMA	84.0	38.5	58.8	56.5	BEAVERHEAD	30	212 57
CLARK CANYON	255.6	179.0	168.5	163.2	RUBY	13	174 62
RUBY RIVER	38.8	39.8	40.4	35.6	BIGHOLE	29	222 67
					BOULDER	14	245 59
					JEFFERSON	68	214 61

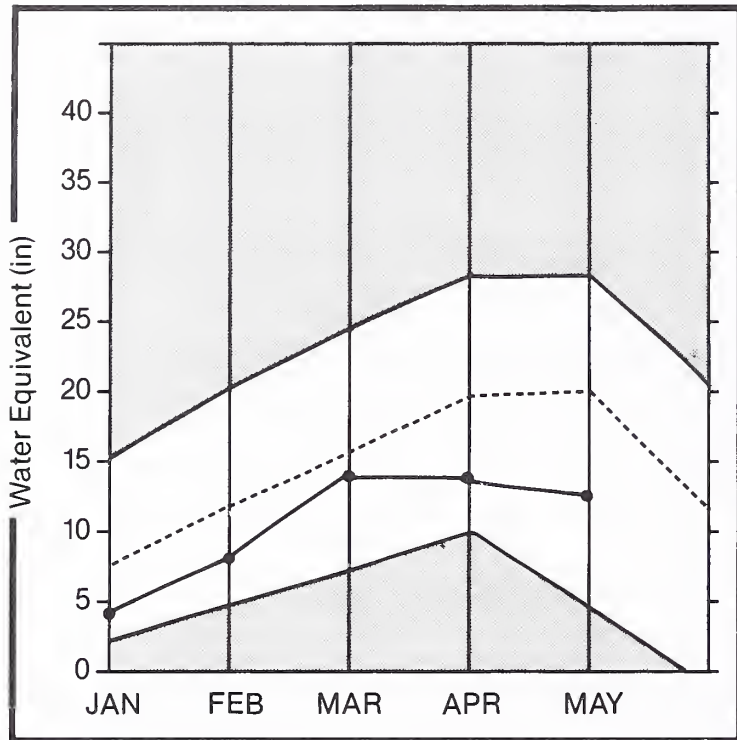
1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.

2 - Corrected for upstream diversions or changes in reservoir storage.

The average is computed for the 1961-85 base period.

Madison Basin

Mountain snowpack* (inches)

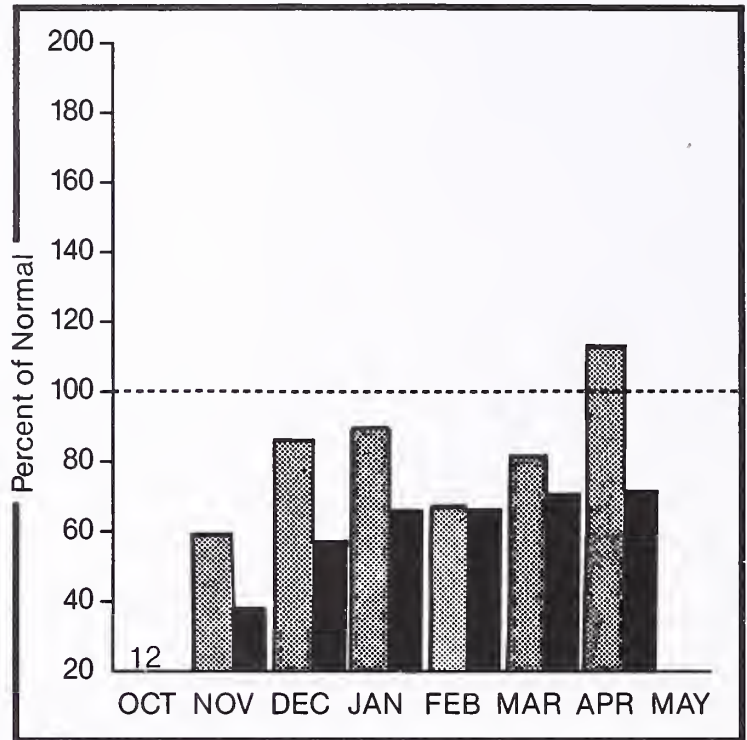


*Madison

Maximum —
Minimum —

Average - - -
Current •—•

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

Water Supply Outlook

During April, both snowmelt and mountain precipitation were above average. Current snowpack levels are about 65 percent of average with a little better conditions in the drainage above Hebgen Lake. May through September streamflows are forecast to total about 75 percent of average.

For more information contact your local Soil Conservation office

MADISON RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
MADISON RIVER near Grayling 2	MAY-JUL	333.0	250.0	75	310.0	93	190.0	57
	MAY-SEP	443.0	330.0	74	395.0	89	265.0	60
MADISON RIVER near McAllister 2	MAY-JUL	577.0	435.0	75	590.0	102	280.0	49
	MAY-SEP	753.0	565.0	75	730.0	97	400.0	53

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY ¹	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE	
ENNIS LAKE	41.0	32.8	27.4	35.7	MADISON above HEBGEN	13	508	68
HEBGEN LAKE	377.5	301.5	316.3	236.2	LOWER MADISON	21	213	62
					MADISON	34	279	64

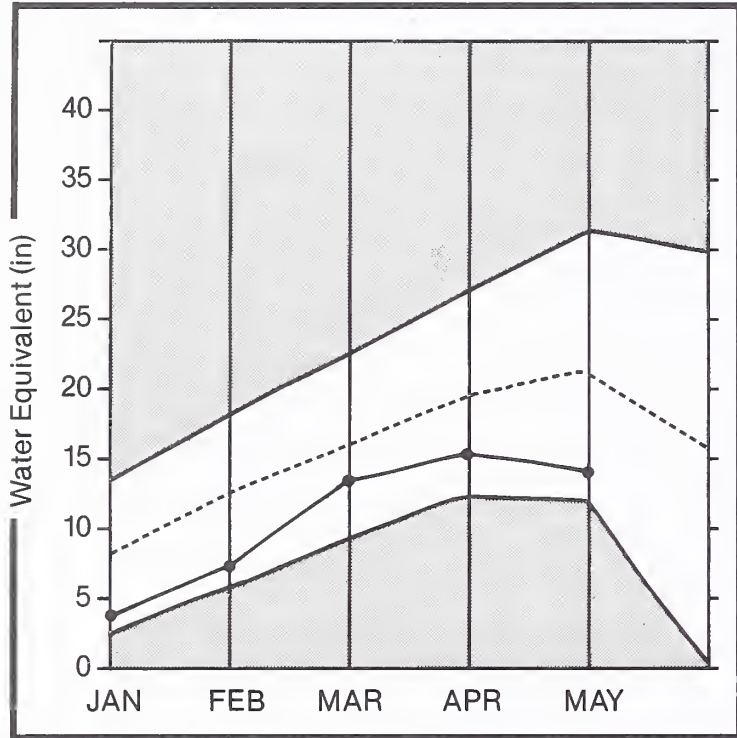
1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.

2 - Corrected for upstream diversions or changes in reservoir storage.

The average is computed for the 1961-85 base period.

Gallatin Basin

Mountain snowpack* (inches)



*Gallatin

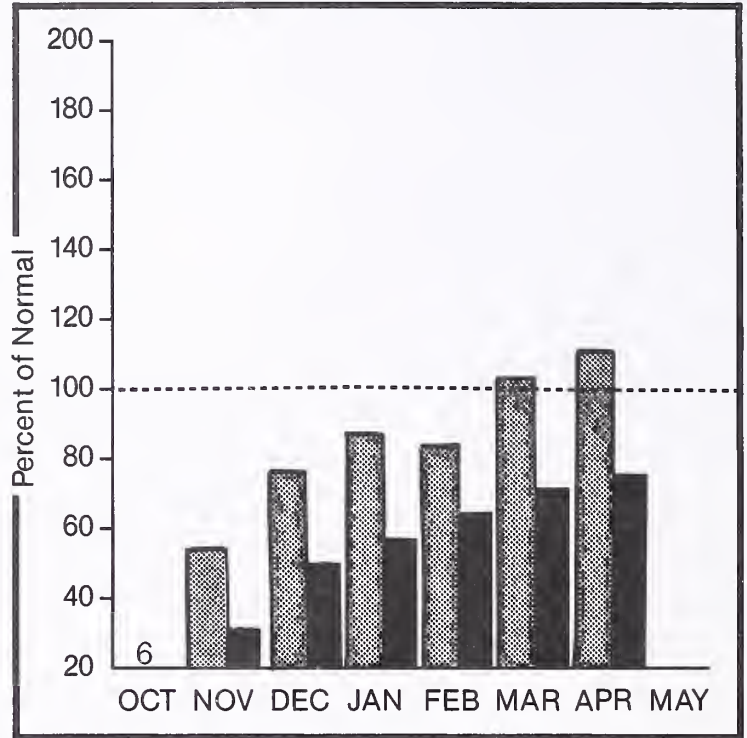
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

Water Supply Outlook

Snowpacks are a little better near Bozeman than in the headwaters of the Gallatin River Drainage. Overall, the current snowpack contains about 70 percent of average water content. April runoff and mountain precipitation were both a little above average. For the next five months, streamflows are forecast to be below average from all drainages. The best runoff is expected from streams near Bozeman. There should be adequate water for irrigation through late June but it is anticipated that shortages will become widespread for the remainder of the irrigation season. The Gallatin River is expected to reach snowmelt peak in early June with a little below average flow.

For more information contact your local Soil Conservation office

GALLATIN RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
GALLATIN RIVER near Gateway	MAY-JUL	430.0	295.0	69	360.0	84	230.0	53
	MAY-SEP	510.0	350.0	69	440.0	86	260.0	51
E & W FK. HYALITE CRK nr Bozeman 2	MAY-JUL	23.0	19.2	83	23.0	100	16.0	70
	MAY-SEP	27.0	23.0	85	28.0	104	18.0	67
HYALITE CREEK near Bozeman 2	MAY-JUL	35.0	29.0	83	37.0	106	21.0	60
	MAY-SEP	41.0	34.0	83	43.0	105	25.0	61
GALLATIN RIVER at Logan	MAY-JUL	458.0	262.0	57	390.0	85	134.0	29
	MAY-SEP	546.0	310.0	57	450.0	82	168.0	31

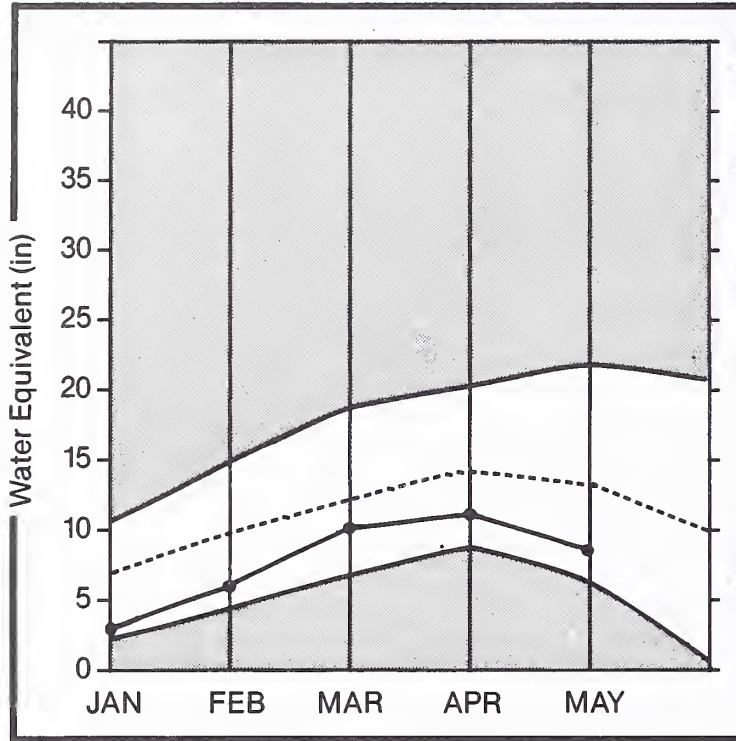
RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE
MIDDLE CREEK	8.0	6.5	7.0	4.4	UPPER GALLATIN	15	203 66
					EAST GALLATIN	12	330 71
					GALLATIN	24	269 68

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Missouri Basin

Mountain snowpack* (inches)

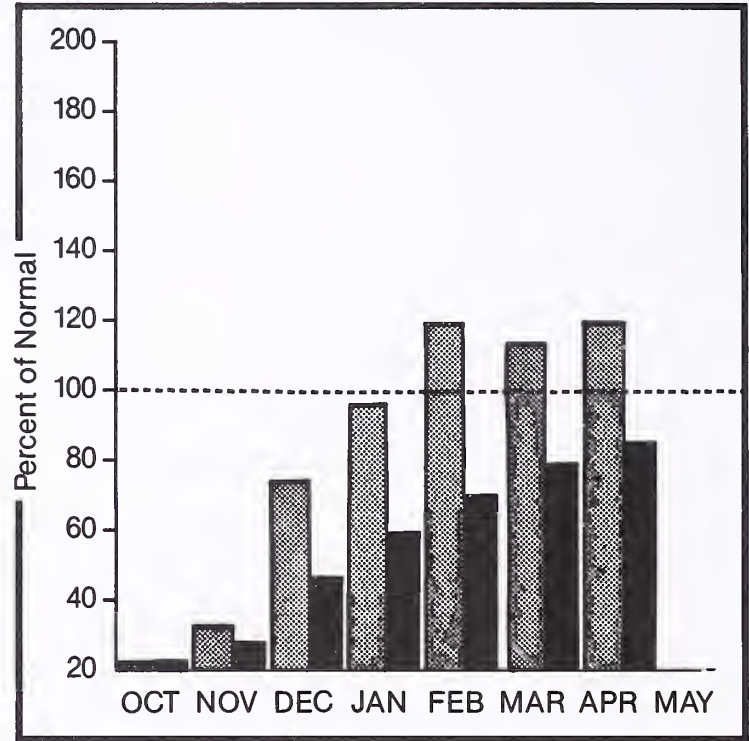


*Missouri Toston to Fort Peck


Maximum 
Minimum 

Average 
Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation  Year to date precipitation 

Water Supply Outlook

Mountain precipitation for April was above average over the basin. Snowmelt was also above average. Currently, the snowpack contains below average water content. Runoff during April was near to a little above average. For the remainder of the season, streamflows are forecast to total well below average. Early season runoff is expected to be adequate but shortages of irrigation water supplies are anticipated to develop by mid to late June. The Upper Missouri River is expected to reach peak snowmelt runoff in late May with a little below average flow.

For more information contact your local Soil Conservation office

MISSOURI RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
MISSOURI RIVER at Toston 2	MAY-JUL MAY-SEP	1890.0 2230.0	1120.0 1375.0	59 62	1680.0 2030.0	89 91	570.0 715.0	30 32
SHEEP CREEK nr White Sulphur Spgs.	MAY-JUL MAY-SEP	17.1 20.0	11.3 13.4	66 67	17.0 20.0	99 100	5.0 7.0	29 35
BELT CREEK near Monarch	MAY-JUL MAY-SEP	114.0 126.0	63.0 70.0	55 56	102.0 110.0	89 87	24.0 30.0	21 24
MISSOURI RIVER at Fort Benton 2	MAY-JUL MAY-SEP	2930.0 3450.0	1520.0 1860.0	52 54	2520.0 3040.0	86 88	1080.0 1350.0	37 39
MISSOURI RIVER at Virgelle 2	MAY-JUL MAY-SEP	3350.0 3900.0	1810.0 2155.0	54 55	3150.0 3700.0	94 95	1470.0 1760.0	44 45
MISSOURI RIVER near Landusky 2	MAY-JUL MAY-SEP	3650.0 4240.0	1970.0 2370.0	54 56	3430.0 4070.0	94 96	1570.0 1910.0	43 45
M.F. MUSSELSHELL near Delpine	MAY-JUL MAY-SEP	4.0 4.9	2.3 2.9	58 59	4.0 5.0	100 102	1.0 1.0	25 20
S.F. MUSSELSHELL above Martinsdale	MAY-JUL MAY-SEP	51.0 55.0	29.0 30.0	57 55	49.0 53.0	96 96	9.0 7.0	18 13
MISSOURI RIVER below Fort Peck 2	MAY-JUL MAY-SEP	3560.0 4100.0	1850.0 2190.0	52 53	3420.0 3980.0	96 97	1460.0 1720.0	41 42
LAKE SAKAKAWEA Inflow 2	MAY-JUL MAY-SEP	9210.0 10380.0	5800.0 6580.0	63 63	9030.0 10200.0	98 98	4140.0 4670.0	45 45

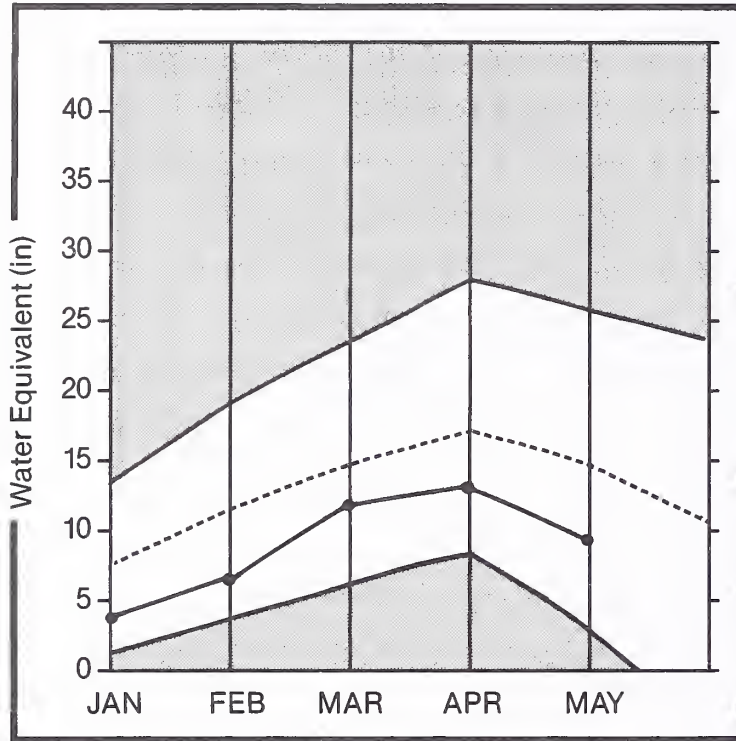
RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE	
CANYON FERRY LAKE	2043.0	1507.0	1573.0	1505.0	MISSOURI HEADWATERS	109	251	63
HELENA VALLEY	9.2	8.5	7.8	7.5	WEST SIDE MISSOURI	11	254	69
LAKE HELENA	10.4	10.9	10.9	10.0	SMITH-BELT	11	314	68
HAUSER & HELENA	61.9	63.1	63.1	60.0	MISSOURI MAINSTEM	22	285	69
HOLTER LAKE	81.9	80.4	80.5	72.6	SUN-TETON-MARIAS	18	146	62
SMITH RIVER	10.6	5.0	9.8	9.4	JUDITH-MUSSELSHELL	17	382	71
NEULAN CREEK	12.4	9.4	10.5	9.7	MISSOURI above FORT PECK	151	239	64
BAIR	7.0	3.1	7.0	6.0	MILK HEADWATERS	4	162	47
MARTINSDALE	23.1	7.0	15.1	12.3	BEAR PAW	7	57	6
DEADMAN'S BASIN	72.2	47.5	63.3	56.6	MILK RIVER	11	154	40
FORT PECK LAKE*	18.9	14.6	16.1	15.3	MISSOURI in MONTANA	160	240	63
					MISSOURI blw YELLOWSTONE	262	199	65

*Million Acre Feet



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Sun, Teton and Marias Basins

Mountain snowpack* (inches)

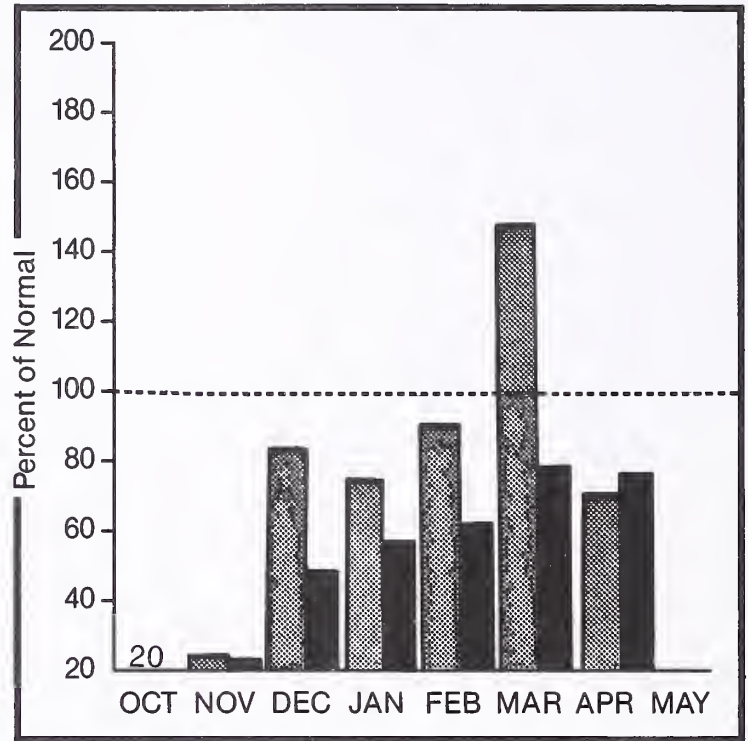


*Sun-Teton-Marias



Maximum 
Minimum 

Average 
Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation 
Year to date precipitation 

Water Supply Outlook

Below average precipitation was measured in the mountains for April. Snowpacks were melting and now contain about 65 percent of average water content. During April, runoff was near to a little above average. The May through September runoff is forecast to be in the 65 to 75 percent of average range. Adequate irrigation water supplies should be available in the early part of the season. By mid to late June, shortages of irrigation supplies could develop

For more information contact your local Soil Conservation office

SUN-TETON-MARIAS RIVER BASINS

STREAMFLOW FORECASTS

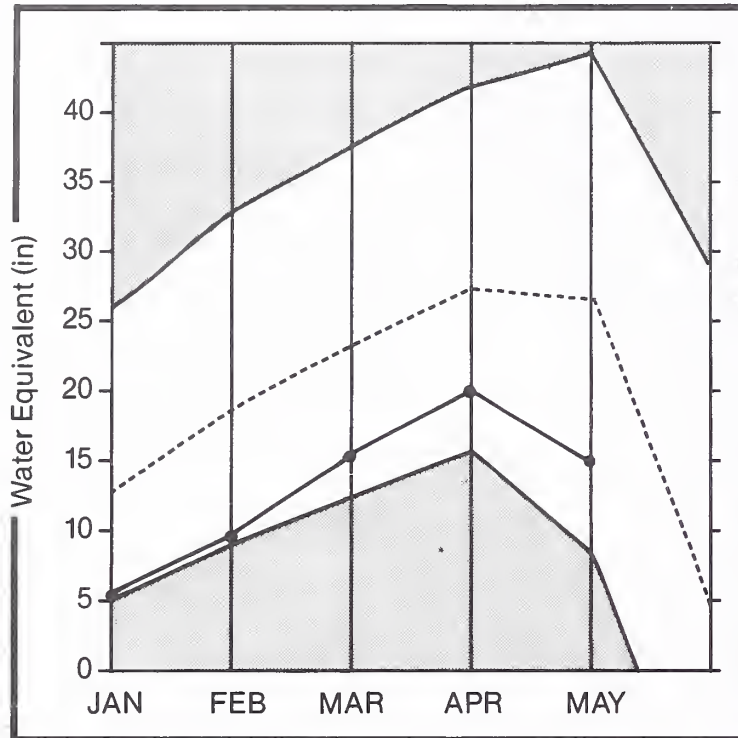
FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
SUN RIVER at Gibson Dam 2	MAY-JUL	462.0	300.0	65	415.0	90	185.0	40
	MAY-SEP	511.0	335.0	66	460.0	90	210.0	41
TWO MEDICINE CREEK near Browning 2	MAY-JUL	197.0	141.0	72	215.0	109	66.0	34
	MAY-SEP	210.0	150.0	71	225.0	107	74.0	35
BADGER CREEK near Browning	MAY-JUL	97.0	68.0	70	105.0	108	31.0	32
	MAY-SEP	114.0	82.0	72	122.0	107	42.0	37
SWIFT RESERVOIR Inflow nr Dupuyer	MAY-JUL	64.0	50.0	78	74.0	116	26.0	41
	MAY-SEP	76.0	59.0	78	86.0	113	32.0	42
CUT BANK CREEK at Cut Bank	MAY-JUL	79.0	56.0	71	86.0	109	26.0	33
	MAY-SEP	88.0	61.0	69	93.0	106	29.0	33
MARIAS RIVER near Shelby	MAY-JUL	412.0	245.0	59	400.0	97	88.0	21
	MAY-SEP	436.0	250.0	57	405.0	93	93.0	21

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	THIS YEAR	LAST YEAR	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE	
GIBSON	99.1	61.5	84.9	53.9	SUN-TETON	13	215	59
FISHKUM	32.0	23.8	27.6	26.6	MARIAS	6	116	66
WILLOW CREEK	32.2	26.9	29.3	23.7	SUN-TETON-MARIAS	18	146	62
LOWER TWO MEDICINE LAKE	11.9	12.3	12.2	10.6				
FOUR HORNS LAKE	19.2	13.9	12.8	12.8				
SHIFT	30.0	23.3	24.9	16.1				
LAKE FRANCES	112.0	98.0	94.1	74.6				
LAKE ELWELL (TIBER)	1347.0	683.9	748.4	582.5				

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St. Mary and Milk Basins

Mountain snowpack* (inches)



* St. Mary

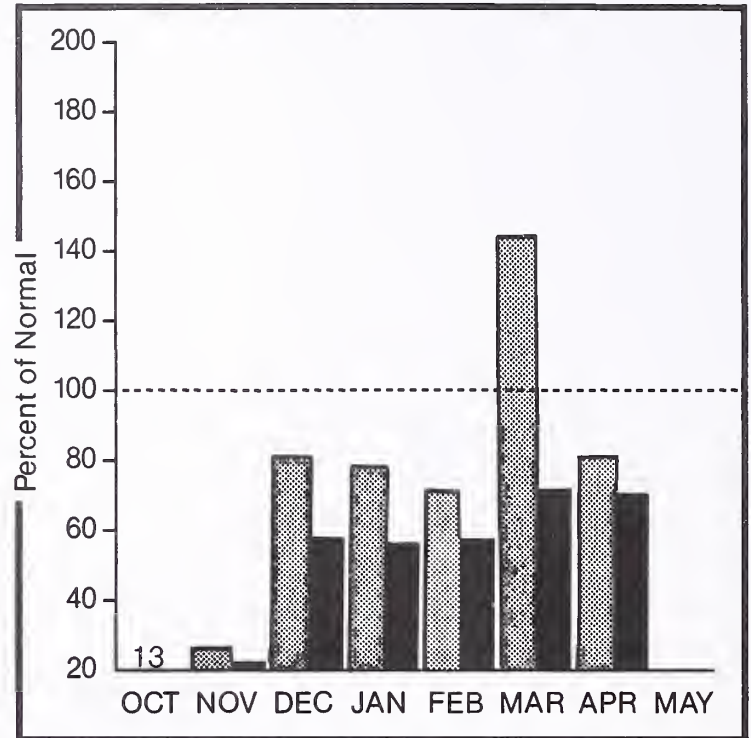
Maximum

Average

Minimum

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

Water Supply Outlook

Snowpack is quite low for this time year in all areas as a result of melt and below average mountain precipitation in April. Runoff was near to above average this past month. It is forecast to be below average for the next five month period. Unless rainfall is average or above, irrigators without stored water are facing another short supply year.

For more information contact your local Soil Conservation office

ST. MARY and MILK RIVER BASINS

STREAMFLOW FORECASTS

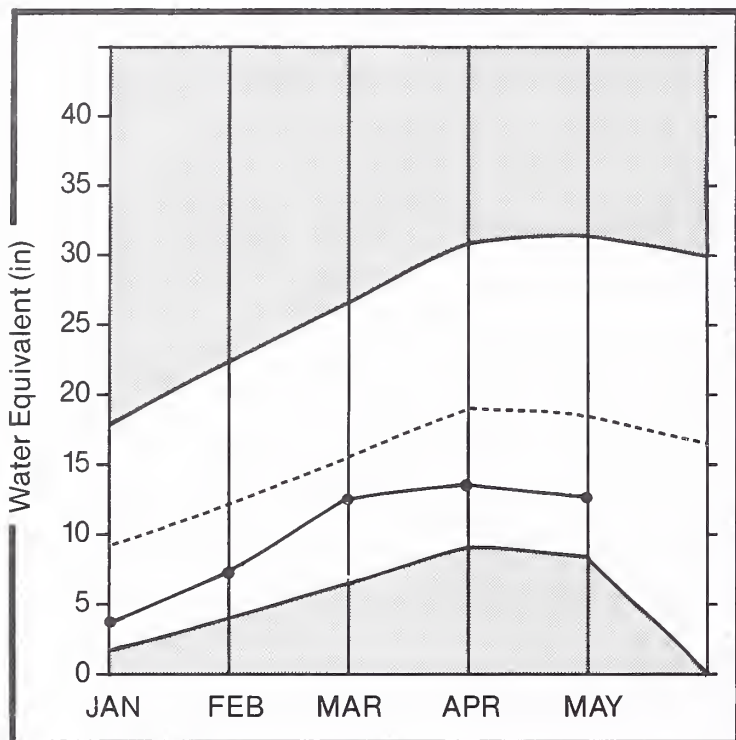
FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
SWIFTCURRENT CREEK at Sherburne 2	MAY-JUL	101.0	76.0	75	98.0	97	54.0	53
	MAY-SEP	119.0	89.0	75	118.0	99	60.0	50
ST. MARY'S RIVER near Babb 2	MAY-JUL	383.0	290.0	76	360.0	94	220.0	57
	MAY-SEP	453.0	345.0	76	425.0	94	265.0	58
MILK RIVER at Eastern Crossing	MAY-SEP	51.0	27.0	53	45.0	88	22.0	43
MILK RIVER at Eastern Crossing 2	MAY-SEP	204.0	197.0	97	219.0	107	184.0	90

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	THIS YEAR	LAST YEAR	AVG.	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE
LAKE SHERBURNE	64.3	6.6	29.1	19.6		MILK HEADWATERS	4	162 47
FRESNO	127.0	94.7	105.3	96.5		BEAR PAW	7	57 6
BEAVER CREEK	3.5	3.0	3.3	2.6		MILK RIVER	11	154 40
NELSON	66.8	41.0	54.7	42.0		ST. MARY	11	108 57
						ST. MARY and MILK	18	108 55
						BOW RIVER in ALBERTA	14	93 89
						OLDMAN RIVER in ALBERTA	3	91 79



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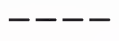

Yellowstone Basin

Mountain snowpack* (inches)

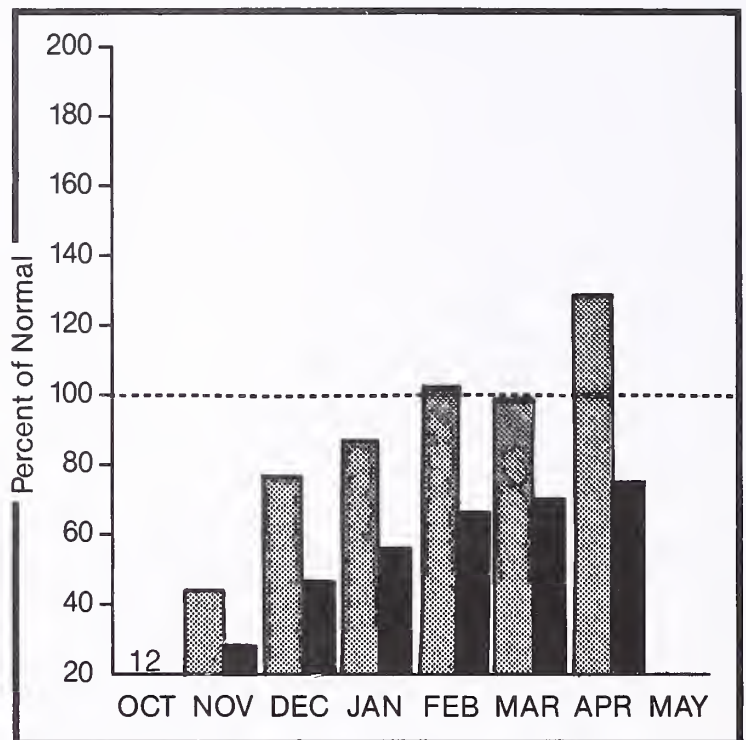


*Yellowstone above Big Horn


Maximum 
Minimum 


Average 
Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation 

Year to date precipitation 

Water Supply Outlook

Mountain precipitation was above average for April over the basin. Snowmelt the last half of the month reduced snowpacks a little earlier than normal. The current amount of water stored in the snowpack is about 70 percent of average in most drainages. Runoff was near to a little below average in April. Forecasts of May through September streamflow are in the 60 to 75 percent of average range. Runoff from some streams with headwaters in Wyoming is expected to be a little better. Early season irrigation water supplies should be adequate but irrigators getting water from smaller streams could see shortages by mid to late June. Peak snowmelt runoff is expected to occur in early June for most areas with flows a little below average.

For more information contact your local Soil Conservation office

YELLOWSTONE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
YELLOWSTONE at Lake Outlet	MAY-SEP	784.0	520.0	66	615.0	78	425.0	54
YELLOWSTONE at Corwin Springs	MAY-JUL	1570.0	970.0	62	1220.0	78	720.0	46
	MAY-SEP	1910.0	1170.0	61	1480.0	77	865.0	45
YELLOWSTONE near Livingston	MAY-JUL	1810.0	1180.0	65	1470.0	81	890.0	49
	MAY-SEP	2220.0	1410.0	64	1760.0	79	1060.0	48
BOULDER RIVER at Big Timber	MAY-JUL	340.0	250.0	74	320.0	94	179.0	53
	MAY-SEP	372.0	280.0	75	360.0	97	200.0	54
STILLWATER RIVER nr Absarokee 2	MAY-JUL	501.0	365.0	73	495.0	99	235.0	47
	MAY-SEP	602.0	445.0	74	575.0	96	315.0	52
CLARK'S FORK RIVER near Belfry	MAY-JUL	519.0	360.0	69	460.0	89	260.0	50
	MAY-SEP	582.0	400.0	69	510.0	88	290.0	50
COONEY RESERVOIR Inflow	MAY-JUL	41.0	28.0	68	39.0	95	17.0	41
	MAY-SEP	51.0	35.0	69	47.0	92	23.0	45
YELLOWSTONE RIVER at Billings 2	MAY-JUL	3480.0	2400.0	69	3030.0	87	1770.0	51
	MAY-SEP	4160.0	2885.0	69	3620.0	87	2120.0	51
BIGHORN RIVER at St. Xavier 2	MAY-JUL	1580.0	1010.0	64	1360.0	86	710.0	45
	MAY-SEP	1790.0	1140.0	64	1540.0	86	805.0	45
LITTLE BIGHORN RIVER near Hardin	MAY-JUL	125.0	90.0	72	145.0	116	41.0	33
	MAY-SEP	144.0	103.0	72	167.0	116	48.0	33
TONGUE RIVER at Decker	MAY-JUL	210.0	152.0	72	275.0	131	67.0	32
	MAY-SEP	235.0	166.0	71	305.0	130	73.0	31
YELLOWSTONE RIVER at Miles City 2	MAY-JUL	5150.0	3500.0	68	4640.0	90	2420.0	47
	MAY-SEP	6020.0	4080.0	68	5420.0	90	2830.0	47
POWDER RIVER at Moorehead	MAY-JUL	204.0	94.0	46	245.0	120	29.0	14
	MAY-SEP	218.0	100.0	46	260.0	119	30.0	14
YELLOWSTONE RIVER near Sidney 2	MAY-JUL	5700.0	3700.0	65	5190.0	91	2510.0	44
	MAY-SEP	6640.0	4260.0	64	5980.0	90	2860.0	43

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	THIS YEAR	LAST YEAR	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE	
MYSTIC LAKE	21.0	0.7	2.6	2.0	YELLOWSTONE ab LIVINGSTON	24	180	69
COONEY	27.4	23.9	24.4	18.6	SHIELDS	10	609	68
BIGHORN LAKE	1356.0	831.8	793.2	681.2	BOULDER-STILLWATER	9	136	65
TONGUE RIVER	68.0	37.8	45.6	36.7	CLARK'S FORK-ROCK CREEK	21	162	70
					YELLOWSTONE above BIGHORN	50	188	68
					LITTLE BIGHORN	5	182	87
					WIND RIVER (Wyoming)	31	125	66
					BIGHORN RIVER (Wyoming)	30	153	73
					BIGHORN BASIN (Total)	56	144	70
					TONGUE RIVER (Wyoming)	15	193	77
					POWDER RIVER (Wyoming)	15	196	67
					YELLOWSTONE RIVER	117	173	69

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.

2 - Corrected for upstream diversions or changes in reservoir storage.

The average is computed for the 1961-85 base period.

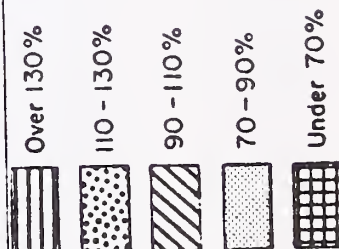
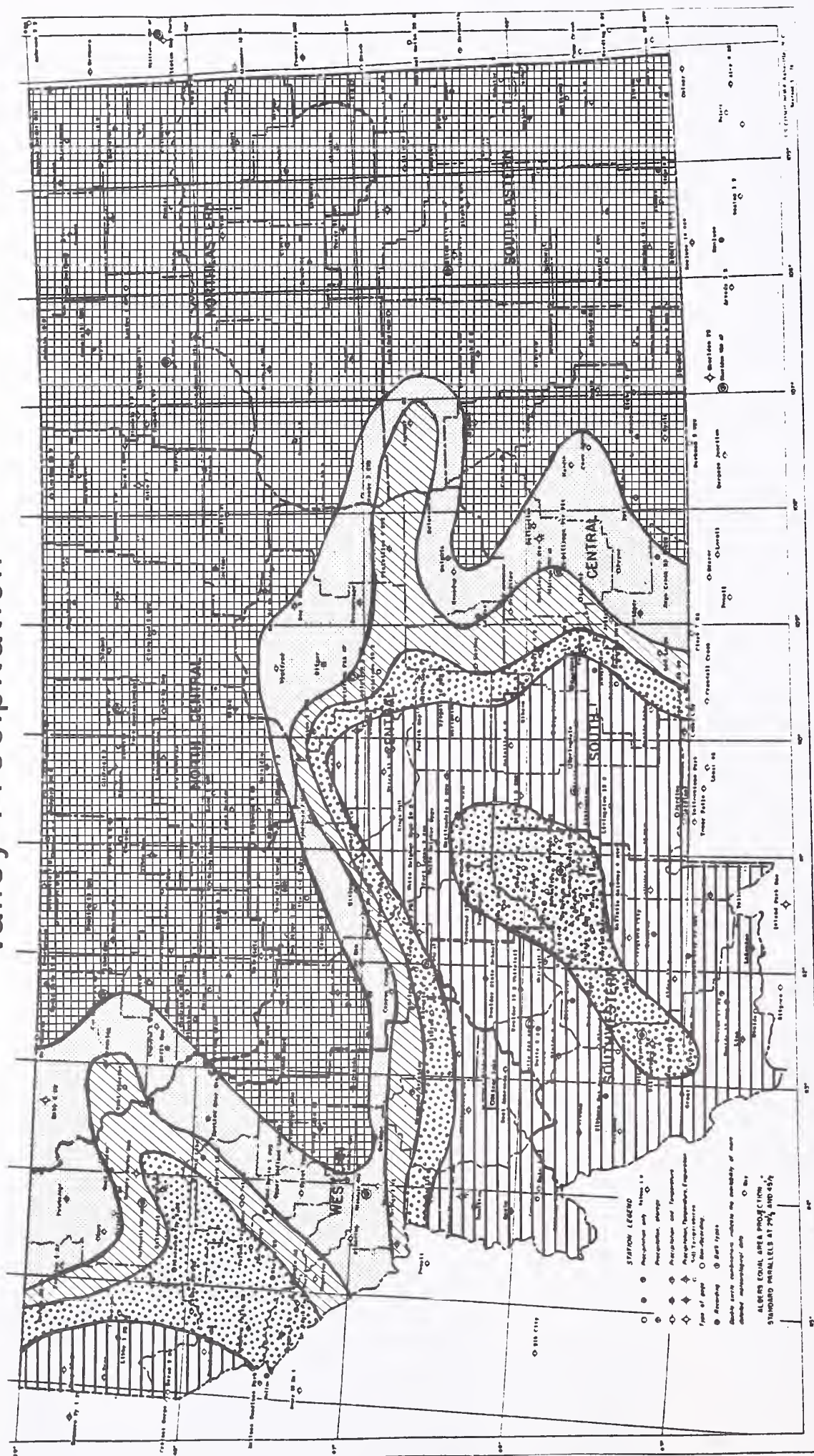
Snow Data Measurements

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85	SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
MONTANA							DAISY PEAK	7600	4/26/88	24	5.8	.0	10.2
ABUNDANCE LAKE	8800	4/26/88	52	16.2	11.4	23.8	DALY CREEK	5780	4/28/88	18	7.2	2.8	12.4
AMBROSE	6480	4/28/88	20	7.9	.1	13.7	DALY CREEK PILLOW	5780	5/01/88	---	.0	.0	6.0
ARCH FALLS	7350	4/26/88	36	11.4	2.6	15.0	DARKHORSE LK. PILLOW	8700	5/01/88	---	22.4	13.5	27.9
ASHLEY DIVIDE	4820	4/28/88	0	.0	.0	1.4	DARKHORSE LAKE	8600	4/26/88	61	21.4	12.6	30.1
BADGER PASS PILLOW	6900	5/01/88	---	28.6	23.4	39.0	DAVIS CREEK	5400	4/24/88	41	15.9	.0	22.3
BADGER PASS	6900	4/27/88	72	32.4	29.9	42.5	DEADMAN CR PILLOW	6450	5/01/88	---	3.1	.0	6.9
BALD EAGLE PEAK	5700	4/24/88	87	41.0E	43.7	63.0	DEADMAN CREEK	6450	4/28/88	10	3.7	.0	8.7
BALD RIOGE	7500	4/29/88	22	9.1	.0	13.3	DESERT MOUNTAIN	5600	4/24/88	14	4.2	.0	14.3
BANFIELD MTN PILLOW	5600	5/01/88	---	9.3	9.0	18.6	DEVILS SLIDE	8100	4/26/88	58	19.2	12.8	27.1
BANFIELD MOUNTAIN	5600	4/24/88	29	11.2	9.0	22.4	DISCOVERY BASIN	7050	4/25/88	25	7.3	.0	11.0
BARRE CREEK	5500	4/28/88	61	28.3	26.1	45.6	DIVIDE	7800	4/27/88	15	3.2	1.6	11.4
BARRE MIDWAY	4600	4/28/88	37	16.8	12.4	31.8	DIVIDE PILLOW	7800	5/01/88	---	9.5	4.5	12.8
BARRE TRAIL	3800	4/28/88	0	.0	.0	1.5	DIX HILL	6400	5/01/88	0	.0	.0	5.4
BARKER LAKES PILLOW	8250	5/01/88	---	13.7	8.5	17.0	DUPUYER CREEK PILLOW	5750	5/01/88	---	6.7	.1	10.7
BASIN CREEK	7180	5/03/88	0	.0	.0	10.3	EAST BOULDER S	9250	4/29/88	54	21.5	13.5	34.5
BASIN CREEK PILLOW	7180	5/01/88	---	8.0	5.9	9.9	EAST FORK R.S.	5400	4/29/88	0	.0	.0	1.2
BASSOO PEAK	5150	4/28/88	0	.0	.0	6.8	ELK HORN SPRINGS	7800	4/26/88	17	3.9	.0	8.6
BEAGLE SPRINGS	8850	4/26/88	24	7.0	4.2	9.6	ELK PEAK	8000	4/26/88	46	14.0	5.4	20.0
BEAGLE SPGS PILLOW	8850	5/01/88	---	5.5	1.2	9.0	EMERY CREEK	4350	4/24/88	8	3.0	.0	9.7
BEAR BASIN	8150	4/25/88	49	16.8	6.8	23.4	EMERY CREEK PILLOW	4350	5/01/88	---	3.3	.2	8.5
BEAR PAW SKI APEA	5200	4/27/88	0	.0	.0	4.2	FATTY CREEK	5500	4/29/88	35	16.2	12.6	24.8
BEAVER CREEK PILLOW	7850	5/01/88	---	14.8	6.4	21.8	FISH CREEK	8000	5/03/88	8	1.2	.0	13.4
BIG CREEK	6750	4/29/88	68	32.8	34.2	51.2	FISHER CREEK PILLOW	9100	5/01/88	---	30.5	20.3	39.5
BIG SKY	7700	4/25/88	36	12.7	2.6	17.7	FISHER CREEK	9100	5/02/88	82	32.3	19.7	42.8
BIG SKY MEADOW	6350	4/25/88	4	.3	.0	3.9	FIVE-BULL	5700	4/27/88	0	.0	.0	3.8
BIG SNOWY	7150	4/28/88	55	21.5	11.4	25.3	FLATTOP MTN PILLOW	6300	5/01/88	---	34.4	35.9	49.2
BLACK BEAR	7950	4/27/88	84	36.5	9.8	44.2	FLEECE RIDGE	7500	4/28/88	16	5.4	.0	9.5
BLACK BEAR PILLOW	7950	5/01/88	---	33.6	9.9	39.1	FODLHEN	8280	4/26/88	44	14.2	8.8	19.3
BLACK MOUNTAIN	7750	4/29/88	31	11.5	7.6	18.1	FOUR MILE	6900	4/29/88	6	1.9	.0	8.1
BLACK PINE PILLOW	7100	5/01/88	---	9.6	.1	14.8	FOURTH OF JULY	3450	4/27/88	0	.0	.0	1.2
BLACK PINE	7100	4/26/88	24	7.8	.0	13.9	FRED BURR PASS	8000	4/28/88	51	20.0	12.6	29.4
BLACKTAIL	5650	4/29/88	6	2.1	.9	--	FREIGHT CREEK	6000	4/27/88	25	9.5	6.8	14.2
BLOODY DICK PILLOW	7550	5/01/88	---	7.4	.1	10.0	FRIDAY HILL	4620	4/27/88	0	.0	.0	12.0
BLOODY DICK	7600	4/26/88	26	8.2	3.0	13.7	FROHNER MEADOWS	6480	4/27/88	5	1.5	.0	6.1
BLUE LAKE	5900	4/27/88	36	15.9	14.8	24.4	FROHNER MDWS PILLOW	6480	5/01/88	---	5.4	.2	9.0
BOTS SDTS	7750	4/28/88	13	3.9	.8	9.3	GARVER CREEK PILLOW	4250	4/24/88	---	.6	.0	4.0
BOULDER MOUNTAIN	7950	4/25/88	52	17.2	11.0	22.7	GARVER CREEK	4250	4/24/88	0	.0	.0	4.7
BOULDER MTN PILLOW	7950	5/01/88	---	16.2	5.6	22.6	GIBBONS PASS	7100	4/29/88	34	15.8	5.8	23.9
BOX CANYON	6670	4/27/88	12	5.0	.0	7.5	GOAT MOUNTAIN	7000	4/28/88	14	4.3	1.0	9.5
BOX CANYON PILLOW	6700	5/01/88	---	2.4	.0	5.1	GOLD STONE	8100	4/26/88	35	11.4	7.9	19.2
BOXELDER CREEK	5100	4/27/88	3	.8	1.4	2.2	GRASSHOPPER	7000	4/25/88	9	1.5	.0	5.3
BRANHAM LAKES	8850	5/02/88	64	25.1	18.2	35.1	GRAVE CRK PILLOW	4300	5/01/88	---	.0	.0	8.5
BRIOGER BOWL PILLOW	7250	4/27/88	---	19.8	3.5	29.7	GRAVE CREEK	4300	4/24/88	7	2.6	.0	14.1
BRIOGER BOWL	7250	4/27/88	58	19.7	2.9	31.3	GRIFFIN CR DIVIDE	5150	4/26/88	1	.4	.6	7.3
BRISTOW CREEK	3900	4/24/88	0	.0	.0	1.6	GUNSLIGHT LAKE	6300	4/27/88	76	35.1	24.5	42.2
BRUSH CREEK TIMBER	5000	4/28/88	0	.0	.0	7.0	HAND CREEK	5030	4/28/88	8	2.6	1.2	10.1
BULL MOUNTAIN	6600	4/28/88	0	.0	.0	3.7	HAND CREEK PILLOW	5030	5/01/88	---	3.5	1.7	9.1
CABIN CREEK	5200	4/27/88	0	.0	.0	2.2	HAWKINS LAKE PILLOW	6450	5/01/88	---	25.1	19.6	30.1
CALL ROAD	8050	4/27/88	28	8.6	4.9	13.9	HAWKINS LAKE	6450	4/24/88	65	27.2	21.4	32.8
CALVERT CREEK	6430	4/28/88	14	4.6	.0	9.6	HEART LAKE TRAIL	4800	4/30/88	22	9.6	2.7	17.4
CALVERT CR PILLOW	6430	5/01/88	---	.0	.0	2.5	HEBGEN DAM	6550	4/26/88	4	1.2	.0	7.6
CAMP MISERY	6400	4/24/88	79	33.6	31.3	53.9	HELL ROARING DIVIDE	5770	4/28/88	45	19.0	18.4	31.6
CAMP SENIA	7890	4/28/88	19	5.6	2.4	9.2	HERRIG JUNCTION	4850	4/26/88	38	15.4	14.4	25.0
CARROT BASIN PILLOW	9000	5/01/88	---	22.4	14.4	32.1	HOLBROOK	4530	5/02/88	0	.0	.0	2.0
CARROT BASIN	9000	4/26/88	73	24.8	16.1	41.7	HOOD MEADOW	6600	4/26/88	26	9.0	.4	11.4
CASHE CREEK PILLOW	7800	5/01/88	---	7.9	2.4	10.5	HOODOO BASIN PILLOW	6050	5/01/88	---	35.0	29.0	49.6
CEDAR GROVE	3760	4/24/88	4	1.2	.0	6.1	HOODOO BASIN	6050	4/30/88	90	42.6	31.1	53.2
CHESSMAN RESERVOIR	6200	4/27/88	3	.8	.0	2.7	HOODOO CREEK	5900	4/30/88	80	35.5	27.2	49.3
CHICKEN CREEK	4060	4/26/88	0	.0	.0	3.8	ICEBERG LAKE NO 3	5600	4/27/88	39	16.8	16.1	31.0
CLOVER MDW PILLOW	8800	5/01/88	---	13.8	7.1	19.0	INDEPENDENCE	7850	4/27/88	31	11.8	5.8	18.2
CLOVER MEADOW	8600	4/27/88	37	13.1	6.8	20.6	INTERGAARD	6450	4/26/88	14	4.1	.1	9.0
COLE CREEK	7850	4/27/88	50	15.4	16.0	23.3	JAHNKE LAKE TRAIL	7200	4/26/88	22	6.0	.0	9.2
COLE CREEK PILLOW	7850	5/01/88	---	16.2	13.2	20.6	JOHNSON PARK	6450	4/26/88	7	.6	.0	2.6
COLLEY CREEK	6300	4/28/88	10	2.8	.0	4.2	JOSEPHINE LOWER NO 9	4900	4/26/88	20	7.7	4.2	16.5
COMBINATION	5600	4/26/88	0	.0	.0	3.5	KEELER CREEK	3300	4/24/88	0	.0	.0	1.2
COMBINATION PILLOW	5600	5/01/88	---	.0	.0	2.1	KINGS HILL	7500	4/28/88	32	12.0	.9	16.1
COOKE STATION	8150	5/02/88	45	16.2	5.9	21.4	KIWANIS CAMP	3720	4/27/88	0	.0	.0	.3
COPPER BOTTOM	5200	4/27/88	3	1.0	.0	4.9	KRAFT CREEK PILLOW	4750	5/01/88	---	.0	.0	4.0
COPPER BOTTOM PILLOW	5200	5/01/88	---	3.0	.0	6.8	LAKE CREEK	6100	4/27/88	0	.0	.0	3.6
COPPER CAMP PILLOW	6950	5/01/88	---	23.2	8.6	33.5	LAKEVIEW CANYON	6930	5/01/88	0	.0	4.2	12.3
COPPER CAMP	6950	4/27/88	48	21.4	13.5	30.6	LAKEVIEW RDG. PILLOW	7400	5/01/88	---	.2	.0	9.6
COPPER CREEK	5700	4/27/88	16	6.8	.0	10.1	LAKEVIEW RIOGE	7400	5/01/88	0	.0	2.9	10.3
COPPER MOUNTAIN	7700	4/25/88	20	5.9	.7	11.8	LEMHI PASS	7480	4/26/88	10	3.2	.8	7.2
COTTONWOOD CREEK	6400	4/29/88	18	6.6	.0	8.4	LEMHI RIOGE	8100	4/26/88	25	7.6	2.8	10.0
COYOTE HILL	4200	4/25/88	0	.0	.0	3.3	LEMHI RIOGE PILLOW	8100	5/01/88	---	9.2	.8	10.5
CRYSTAL LAKE	6050	4/28/88	25	10.8	.0	12.9	LICK CREEK PILLOW	6860	5/01/88	---	7.4	.0	9.6
CRYSTAL LAKE PILLOW	6050	5/01/88	---	9.0	.0	12.5	LICK CREEK	6860	4/26/88	33	10.2	2.4	10.3
DAQ CREEK LAKE	8400	4/26/88	41	13.1	11.8	17.2	LITTLE PARK	7400	4/25/88	35	11.0	4.6	17.8
							LOGAN CREEK	4300	4/28/88	0	.0	.0	2.5
							LONE MOUNTAIN	8880	4/25/88	55	16.4	6.5	26.7

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
LOST HORSE	5940	5/01/88	58	25.0	14.6	33.9
LOST SOUL	4800	4/24/88	7	2.4	.0	8.8
LOWR TWIN PILLOW	7900	5/01/88	---	16.1	11.6	22.7
LOWR TWIN	7900	4/29/88	42	17.3	8.2	25.2
LUBRECHT FLUME	4680	5/02/88	0	.0	.0	.6
LUBRECHT PILLOW	4680	5/01/88	---	.0	.0	.4
LUBRECHT FOREST NO 3	5450	5/02/88	0	.0	.0	3.6
LUBRECHT FOREST NO 4	4650	5/02/88	0	.0	.0	.2
LUBRECHT FOREST NO 6	4040	5/02/88	0	.0	.0	.1
LUBRECHT HYDROPLT	4200	5/02/88	0	.0	.0	.3
MADISON PLT PILLOW	7750	4/27/88	---	20.1	7.4	24.3
MADISON PLATEAU	7750	4/27/88	48	20.0	2.5	23.2
MANY GLACIER	4900	4/28/88	20	8.0	.0	12.2
MANY GLACIER PILLOW	4900	5/01/88	---	.2	.0	8.6
MARIAS PASS	5250	4/30/88	12	4.4	5.2	16.0
MAYNARD CREEK	6210	4/27/88	38	12.2	.0	17.0
MAYNARD CR PILLOW	6210	4/27/88	---	9.1	.0	13.1
MIDDLE MILL CREEK	7850	5/02/88	29	9.4	2.6	18.2
MILL CREEK	7500	4/28/88	23	7.6	.0	12.3
MINERAL CREEK	4000	4/29/88	5	1.8	.0	12.3
MONUMENT PK PILLOW	8850	5/01/88	---	16.8	11.5	24.6
MONUMENT PEAK	8850	4/27/88	58	21.9	15.7	30.0
MOSS PEAK	6780	4/29/88	60	31.2	32.6	--
MOSS PEAK PILLOW	6780	5/01/88	---	26.8	28.1	48.1
MOULTON RESERVOIR	6850	5/04/88	8	2.3	.0	3.1
MOUNT ALLEN NO 7	5700	4/26/88	72	29.9	31.4	46.1
MT LOCKHART PILLOW	6400	5/01/88	---	18.1	12.0	23.0
MOUNT LOCKHART	6400	5/02/88	40	17.2	9.4	22.8
MUDD LAKE	7650	4/27/88	38	15.4	4.8	20.4
MULE CREEK	8300	4/28/88	42	14.8	7.8	16.0
MULE CREEK PILLOW	8300	5/01/88	---	15.2	9.6	16.2
NEVADA CREEK	6480	4/27/88	23	8.7	2.4	12.4
NEVADA CREEK PILLOW	6480	5/01/88	---	11.1	4.0	13.6
NEWTON MOUNTAIN	5600	4/27/88	56	24.6	18.3	36.8
NEZ PERCE CMP PILLOW	5650	5/01/88	---	10.7	1.8	10.6
NEZ PERCE CAMP	5650	4/29/88	19	9.0	1.0	12.7
NEZ PERCE CREEK	6600	4/25/88	4	.4	.0	4.3
NEZ PERCE PASS	6570	4/29/88	20	9.2	.0	15.5
NOISY BASIN	6040	4/24/88	75	31.0	30.0	52.5
NOISY BASIN PILLOW	6040	5/01/88	---	29.1	26.3	46.7
N.F. ELK CR PILLOW	6250	5/01/88	---	.6	.0	10.2
N.F. ELK CREEK	6250	5/02/88	8	3.1	.0	10.1
NORTH FORK JOCKO	6330	4/29/88	63	30.6	21.1	46.6
NORTH MEADOW	7500	4/29/88	15	4.3	.0	10.6
N.E. ENTRANCE PILLOW	7350	5/01/88	---	1.6	.0	6.7
NORTHEAST ENTRANCE	7350	5/01/88	0	.0	.0	7.0
NOTCH	8500	4/27/88	39	9.6	9.3	20.0
OPHIR PARK	7150	5/01/88	30	11.9	7.8	18.2
PALISADE CREEK	8250	4/27/88	59	26.8	11.2	32.8
PETERSON MOW PILLOW	7200	4/25/88	---	9.8	2.2	12.1
PETERSON MEADOWS	7200	4/25/88	32	9.3	.6	11.6
PICKET PIN D	9450	4/29/88	42	16.5	18.5	28.8
PICKFOOT CREEK	6650	4/25/88	13	3.2	.0	7.1
PICKFOOT CRK PILLOW	6650	5/01/88	---	2.4	.0	6.7
PIEGAN PASS NO 6	5500	4/26/88	57	23.9	24.0	39.6
PIKE CREEK PILLOW	5930	5/01/88	---	17.0	13.1	26.8
PIPESTONE PASS	7200	4/25/88	10	2.6	.9	5.7
PLACER BASIN F	8830	4/29/88	32	12.0	13.5	23.4
PLACER BASIN PILLOW	8830	5/01/88	---	17.1	13.5	19.5
POORMAN CREEK	5100	4/24/88	37	16.4	10.7	32.0
PORCUPINE PILLOW	6500	5/01/88	---	.8	.0	4.4
PORCUPINE	6500	4/29/88	7	2.9	.0	7.4
POTOMAGETON PARK	7150	4/25/88	3	.6	.0	10.7
PTARMIGAN	5800	4/27/88	57	23.8	25.5	37.9
RED MOUNTAIN	6000	4/29/88	27	9.9	8.5	18.6
RED TOP	5260	4/27/88	38	15.8	7.5	29.6
ROCK CREEK	5600	4/28/88	7	2.7	.0	6.2
ROCK CREEK MEADOW	8160	4/28/88	49	17.7	10.6	24.7
ROCKER PEAK	8000	4/27/88	38	12.7	4.2	17.0
ROCKER PEAK PILLOW	8000	5/01/88	---	15.1	11.8	18.5
ROCKY BOY	4700	4/27/88	0	.0	.0	1.7
ROCKY BOY PILLOW	4700	4/27/88	---	.0	.0	2.9
SACAJAWEA	6550	4/27/88	23	7.4	.0	14.3
SADDLE MTN PILLOW	7900	5/01/88	---	20.1	8.8	29.1
SADDLE MOUNTAIN	7940	4/29/88	50	22.2	12.5	28.6
SENTINEL CREEK	8300	4/25/88	49	16.5	4.0	26.0
SHORT CREEK	7000	5/02/88	9	1.5	.1	--
SHOWER FALLS	8100	4/26/88	60	20.4	13.9	29.0
SHOWER FALLS PILLOW	8100	5/01/88	---	23.0	12.6	29.5
SILVER RUN	6630	4/27/88	5	1.3	.0	3.8
SILVER RUN PILLOW	6630	5/01/88	---	.9	.0	1.4
SKALKAHU PILLOW	7260	5/01/88	---	21.3	13.1	25.6
SKALKAHU SUMMIT	7250	4/28/88	46	19.7	10.7	27.6

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
SKYLARK TRAIL PILLOW	6200	5/01/88	---	26.7	10.8	34.0
SLAG-A-MELT LAKE	8750	4/26/88	60	19.7	11.1	29.0
SLIOE ROCK MOUNTAIN	7100	4/25/88	34	11.8	5.7	18.5
SMUGGLER MINE	6960	5/02/88	11	3.0	.6	9.9
S.F. SHIELDS PILLOW	8100	5/01/88	---	16.5	3.5	21.5
S.F. SHIELDS	8100	4/29/88	57	25.0	10.2	29.0
SPOTTED BEAR MTN.	7000	4/27/88	6	2.4	.0	10.4
SPUR PARK PILLOW	8100	5/01/88	---	20.0	8.7	24.2
SPUR PARK	8100	4/28/88	48	18.6	4.0	24.1
STAHL PEAK	6030	4/24/88	76	31.1	36.2	44.2
STAHL PEAK PILLOW	6030	5/01/88	---	26.4	34.9	41.2
STAR LAKE E	9650	4/29/88	86	35.5	21.5	47.7
STEMPLE PASS	6600	4/27/88	24	7.1	3.0	11.1
STORM LAKE	7780	4/25/88	42	12.4	1.5	16.1
STRYKER BASIN	6180	4/26/88	54	19.5	29.9	37.1
STUART MILL	6500	4/26/88	2	.4	.0	--
STUART MOUNTAIN	7400	4/29/88	42	19.7	16.1	33.9
SUCKER CREEK	3960	4/27/88	0	.0	.0	.4
TAYLOR ROAD	4080	4/27/88	0	.0	.0	.7
TEN MILE LOWER	6600	4/26/88	15	3.4	.0	6.2
TEN MILE MIDDLE	6800	4/26/88	36	9.5	4.3	13.2
TEN MILE UPPER	8000	4/26/88	40	12.1	4.5	16.1
TEPEE CREEK PILLOW	8000	5/01/88	---	10.4	3.3	14.7
TEPEE CREEK	8000	4/27/88	38	11.0	7.8	17.6
TIMBERLINE CREEK	8850	4/28/88	42	13.8	10.0	18.7
TRAIL CREEK	7090	4/26/88	6	1.8	.0	7.5
TRINKUS LAKE	6100	4/27/88	65	29.8	20.6	45.2
TRUMAN CREEK	4060	4/28/88	0	.0	.0	.7
TV MOUNTAIN	6800	4/29/88	24	9.0	3.8	20.0
TWELVEMILE PILLOW	5600	5/01/88	---	2.6	.0	13.2
TWELVEMILE CREEK	5600	5/01/88	9	3.8	.0	16.0
TWENTY-ONE MILE	7150	4/30/88	20	7.0	.0	16.3
TWIN CREEKS	3580	4/27/88	0	.0	.0	2.3
TWIN LAKES PILLOW	6400	5/01/88	---	31.4	22.3	42.6
TWIN LAKES	6510	5/01/88	78	34.0	23.8	45.2
UPPER HOLLAND LAKE	6200	4/27/88	60	26.8	13.9	36.7
WALORON PILLOW	5600	5/01/88	---	3.7	.0	7.0
WALDRON	5600	5/02/88	0	.0	.0	5.5
WARM SPRINGS	7800	4/28/88	39	14.5	6.8	22.0
WARM SPRINGS PILLOW	7800	5/01/88	---	19.5	12.6	31.2
WEASEL DIVIOE	5450	4/24/88	57	24.4	20.2	35.1
WEST YELL ST PILLOW	6700	4/30/88	---	.0	.0	6.2
WEST YELLOWSTONE	6700	4/30/88	0	.0	.0	8.0
WHISKEY CREEK PILLOW	6800	5/01/88	---	10.6	2.9	15.7
WHISKEY CREEK	6800	4/27/88	26	10.7	.0	18.7
WHITE MILL PILLOW	8700	5/01/88	---	19.9	12.9	27.9
WHITE MILL	8700	5/02/88	60	23.9	13.2	30.5
WHITE PINE RIOGE	8850	4/26/88	10	2.0	2.6	6.4
WILLOW CREEK	6500	4/27/88	12	3.1	.0	5.4
WOOD CREEK	5960	4/27/88	9	3.4	.0	7.5
WOOD CREEK PILLOW	5960	5/01/88	---	4.6	1.2	9.2
WRONG CREEK	5700	4/26/88	14	4.8	.6	10.4
WRONG RIOGE	6800	4/26/88	34	13.1	8.7	19.6

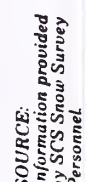
Valley Precipitation



Source: NWS
Great Falls, MT

APRIL 1988

JUNE 1985 4-R-39296-1



ESTIMATES OF PEAK SNOWMELT RUNOFF

	Peak Day <u>Range in cfs</u>	1961-85 Avg. <u>cfs</u>
COLUMBIA RIVER		
Blackfoot River near Bonner	4,000 - 7,000	9,588
Clark Fork River above Missoula	7,000 - 12,000	16,738
Bitterroot River near Darby	4,000 - 6,000	6,229
Clark Fork River below Missoula	17,000 - 27,000	31,992
Clark Fork River at St. Regis	22,000 - 35,000	39,984
N. Fk. Flathead near Columbia Falls	10,000 - 16,000	21,189
M. Fk. Flathead near West Glacier	9,000 - 15,000	22,463
MISSOURI RIVER DRAINAGE		
Big Hole River near Melrose	4,000 - 6,500	8,015
Ruby River above Reservoir	450 - 800	1,037
Gallatin River near Gateway	3,000 - 4,200	5,389
Gallatin River near Logan	2,500 - 4,500	5,581
Missouri River at Toston	11,000 - 17,000	19,042
Marias River near Shelby	3,000 - 6,000	11,516
S. Fk. Musselshell above Martinsdale	400 - 600	1,229
YELLOWSTONE RIVER DRAINAGE		
Yellowstone River at Corwin Springs	7,000 - 13,000	17,532
Yellowstone River at Livingston	10,000 - 15,000	20,732
Boulder River near Big Timber	3,500 - 5,000	5,226
Stillwater River near Absarokee	4,000 - 6,000	6,601
Clarks Fork River near Belfry	4,500 - 6,500	7,706
Yellowstone River at Billings	25,000 - 35,000	42,716

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canadian

Department of the Environment
Atmospheric Environment Service
Water Management Service
British Columbia Ministry of Environment
Inventory and Engineering Branch, Hydrology Section
Alberta Environment
Technical Services Division

Federal

U.S. Department of Agriculture
Forest Service
U.S. Department of the Army
Corps of Engineers
U.S. Department of Commerce
NOAA, National Weather Service
National Environmental Satellite Service
U.S. Department of the Interior
Bureau of Indian Affairs
Fish and Wildlife Service
Geological Survey
National Park Service
Bureau of Reclamation
U.S. Department of Energy
Bonneville Power Administration

State

Montana Conservation Districts
Montana Department of Fish, Wildlife, and Parks
Montana Department of Natural Resources and Conservation
Montana Department of State Lands
Montana State University - Agricultural Experiment Station
University of Montana - School of Forestry

Private

Big Sky of Montana
Butte Water Company
Confederated Salish & Kootenai Tribes
Flathead Valley Community College
Montana Power Company
Pondera County Canal & Reservoir Company

Other organizations and individuals furnish information for the snow survey reports.

Their cooperation is gratefully acknowledged.

**UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SNOW SURVEY UNIT**

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Bozeman, MT 59715**

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